



**ALL INDIAN PUEBLO COUNCIL
PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION**

**PRELIMINARY ASSESSMENT
JEMEZ OPEN DUMP
SANDOVAL COUNTY, NEW MEXICO
CERCLIS ID # NM0000134007**

**SUBMITTED TO:
MARK SATTERWHITE
SUPERFUND INDIAN COORDINATOR
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI, DALLAS, TEXAS**

**SUBMITTED BY:
THE ALL INDIAN PUEBLO COUNCIL
PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION**

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**ALL INDIAN PUEBLO COUNCIL
PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION**

**PRELIMINARY ASSESSMENT
JEMEZ OPEN DUMP
SANDOVAL COUNTY, NEW MEXICO**

AUGUST 25, 1994

SUBMITTED TO:

**MARK SATTERWHITE
SUPERFUND INDIAN COORDINATOR
US-EPA, REGION VI
DALLAS, TEXAS**

PREPARED BY:



**KENDRA L. TSO
Environmental Scientist**

REVIEWED BY:



**CHARLES M. SANCHEZ
Multi - Site Team Leader**

APPROVED BY:

**LLOYD SUINA
Director**

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PREPARED BY: Kendra L. Tso, Environmental Scientist
Pueblo Office of Environmental Protection
P.O. Box 3256
Albuquerque, New Mexico 87190

SITE: Jemez Open Dump
4 miles north of State Road 4
Jemez Pueblo, New Mexico

CERCLIS ID # NM0000134007

1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), the Superfund Amendments and Reauthorization Act of 1986 (SARA), and a Cooperative Agreement between the United States Environmental Protection Agency Region VI (EPA) and the All Indian Pueblo Council/Pueblo Office of Environmental Protection (AIPC/POEP), the POEP-Superfund program conducted a Preliminary Assessment (PA) at the Jemez Open Dump Site.

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The scope of this investigation was to review existing information as well as to collect new information concerning the conditions at the site within the Jemez Pueblo, New Mexico. The scope of the PA includes the review of available information from Federal, state, local, and tribal agencies and performance of an on-site reconnaissance. The purpose of this investigation was to assess the threat posed to human health and the environment and to determine the need for additional CERCLA/SARA or other appropriate action.

The Jemez Open Dump site was identified as a potential hazardous waste site as part of a discovery inventory conducted by EPA using aerial photography. This discovery inventory of the Pueblos in New Mexico was conducted to systematically search for potential hazardous waste sites and document site activity and changes (U.S. EPA, 1990). The CERCLIS identification number for the site is NM0000134007. On April 4, 1994, a site reconnaissance was performed at the Jemez Open Dump site, and general information regarding the site was obtained.

2.0 SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

2.1 Site Location:

The Jemez Open Dump Site is located in the north central part of the State of New Mexico within the boundaries of Sandoval County (U.S.G.S., 1972). The geographic coordinates are 35°35'05" N Latitude and 106°46'10" W Longitude (U.S.G.S., 1972). The site covers approximately 10 acres in the northeast quarter of Section 28, Township 16 North, Range 2 East of the Jemez Pueblo Quadrant (U.S.G.S., 1972). To reach the site, travel north on I-25 for approximately 15 miles, exit at 242 then travel west on State Road 44 for approximately 25 miles to San Ysidro, and then travel north approximately four miles to Jemez Pueblo. The site is located approximately one mile south from the Pueblo. The vicinity of the Jemez Pueblo is characterized by average summer temperatures ranging from 80° - 90° and average winter temperatures ranging from 30° - 40° (Shendo, 1993). The average mean annual precipitation for the area is approximately 16.94 inches (Vannozzi, 1993).

2.2 Site Description:

The Jemez Open Dump area is approximately 39 acres consisting of 10 acres of the active portion and the remaining 29 acres of surficial dumping (POEP, 1993, 1994; Photo 6.0). The surficial dumping are located approximately 500 feet west from the open dump site. These dump areas may have possibly been the old open dump area (POEP, 1993). The active portion consists of one active trench and two buried trenches (P.O.E.P., 1993; 1994; Figure 2.0). The perimeter of the site is fenced with no access restrictions. Access to the dump site is gained via a dirt road originating 1.0 mile west of the site. Upon entrance from State Road 4, there is a sign posted which restricts dumping from non-tribal members (POEP, 1994; Photo 2.0). The dump is located on a flat terrain that gently slopes in a southerly direction toward the unnamed arroyo. The unnamed arroyo is approximately 200 feet south of the site. This arroyo flows west toward the Jemez River located approximately 1.5 miles west of the site (Figure 1.0). Site reconnaissance observations also reveal that the primary surface vegetation at the site consist of range grasses and juniper trees (POEP, 1994). The nearest Pueblo residence is located approximately 1.0 mile west from the site (POEP, 1994; Gachupin, 1994).

2.3 Operational History and Waste Characteristics:

The Pueblo of Jemez owns and operates the open dump for disposal of household wastes by tribal members. The site operates 24 hours a day, seven days of the week. However, there is no monitoring of the types or amounts of waste being disposed. The open dump is fenced with no physical access restrictions. The Pueblo of Jemez did not keep any formal records of the amounts and types of wastes being disposed. The Jemez Open Dump site is an active site which has been in operation for approximately 20 years (Loretto, 1994). There are three primary areas of interest, the two buried portions and the active portion. The buried portion of the site was active for approximately 10 years (Gachupin, 1994). The estimated dimensions of these two buried trenches are 150 feet long, 150 feet wide, and 15 feet deep (Loretto, 1994). The active portion of the site consists of an active trench with estimated dimensions of 150 feet long, 150 feet wide, and 15 feet deep. Common disposal practices at the site is to excavate the trenches, fill the trenches to capacity, spread the wastes, and place a layer of soil upon reaching capacity (Loretto, 1994). The site appears to be operating under open dump conditions which may include burning of the unknown wastes and periodic lack of soil cover. The active trench is not lined and there are no engineered controls of surface run-off and run-on (POEP, 1994). Contents of the trench can be classified as a waste pile source since they are open and not covered daily. The two sources that have been identified include the active and buried trenches.

3.0 GROUND WATER PATHWAY

3.1 Hydrogeological Setting:

A general characterization of the surface and sub-surface geology was requested of Dr. John Hawley of the New Mexico Bureau of Mines. On May 12, 1994, Dr. Hawley visited the dump site area and provides the following interpretation: "The dump site area is located on a arroyo valley. The major aquifer is the Zia Formation. The estimated depth to the water table at the landfill site is 50 feet. The major aquifer is the Zia Formation. The Zia

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consists of sand and sandstone of a windblown origin. The exposed area of the landfill walls consist of sand with a few thin layers of loamy sand (Hawley, 1994)."

3.2 Ground Water Targets:

Within a four-mile radius of the site there are approximately 23 wells, eight private wells, two monitoring wells, one stockwell, two irrigation test wells, two municipal wells, and eight observation wells (Jemez Water Tanks - PA, 1993; U.S.G.S., 1978). The Jemez Pueblo is served by two water tanks which are located approximately 2.0 miles northwest of the site (Jemez Water Tanks - PA, 1993). These two tanks serve the entire population of Jemez Pueblo which consists of approximately 1700 people. The Jemez Pueblo does not have a wellhead protection plan within the Pueblo boundaries. The approximate number of wells are shown in Table 1.0.

3.3 Ground Water Conclusions:

A release of hazardous substances from the Jemez Open Dump to the ground water is suspected due to the coarse and unconsolidated soil, the trenching method of waste disposal, lack of a liner, and the length of time unregulated wastes were disposed. The majority of the wells are located between one to two miles from the site. These wells are located upgradient from the site.

4.0 SURFACE WATER PATHWAY

4.1 Hydrologic Setting:

The climate of the Jemez Pueblo area is mild with average daily temperatures in the summer of 80° - 90° F and in the winter of 30° - 40° F. The mean annual precipitation for the area is approximately 16.96 inches and the 2-yr, 24-hour rainfall is 1.4 inches (Ashby, 1994). The Jemez River runs from north to south and is located approximately 1.5 miles downstream and west of the site (U.S.G.S., 1972). The upgradient drainage area of the Jemez River is 470 square miles with a flow rate of 79.0 cubic feet per second (U.S.G.S., 1972). The 15-mile instream segment includes approximately 1.0 mile of the unnamed arroyo that flows west toward the Jemez River. The remaining 14 miles of the instream segment is the Jemez River which flows south (U.S.G.S., 1972).

4.2 Surface Water Targets:

The Jemez River is the largest surface water body approximately 1.5 miles downstream from the site. There are no drinking water intakes within 15 miles downstream of the site (Morgan, 1994). However, the Jemez River has cultural significance for the people of Jemez Pueblo (Armijo, 1994). The residents are served by two domestic water tanks in the area. The Jemez River is used for recreational fishing and commonly caught aquatic species are Rainbow trout and German Brown trout (Fragua, 1993). Along the Jemez River, is the location of wetlands (U.S. Fish & Wildlife, 1980). The wetlands are located 1.5 miles west from the site, and are included within the 15-mile instream along with Jemez River. There are endangered and threatened species known to habitat near or within the open dump site and the wetlands. These species are the Whooping Crane, Bald Eagle, Black-footed ferret,

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American peregrine falcon, and the Southwestern willow flycatcher (Fowler-Propst, 1994). The targets mentioned above are considered secondary targets due to their distances from the open dump site.

4.3 Surface Water Conclusion:

There is a suspected release of contaminants to nearby surface waters due to the lack of surface run-on and run-off control. The disposal methods of the open dump show that monitoring of the site is not enforced and knowledge of what types of waste are disposed of are unknown. The unnamed arroyo and the Jemez River are the surface waters near the site. The sensitive environments consisting of the wetlands and the endangered and threatened species may be impacted due to their proximity from the site.

5.0 SOIL EXPOSURE AND AIR PATHWAYS

5.1 Soil Exposure and Targets:

The Jemez Open Dump is currently active and accepting household wastes from tribal members of Jemez Pueblo. The current disposal practices are to excavate trenches, fill to a maximum capacity, compact, and cover the wastes with top soil. Currently, the 10 acre site has one active trench and common practice is to burn the wastes. The buried trenches have vegetation growing upon it which signifies a minimal potential to release. There are no workers or residents on-site. The nearest Jemez resident is approximately 1.0 mile west of the site, and there are no schools or daycare centers within 200 feet of the site (P.O.E.P., 1994). The population within a four-mile radius of the site is approximately 1700 people (Jemez Water Tanks, 1993). The approximate number of people living relative to the site are shown in Table 2.0.

5.2 Air Pathway and Targets:

Observations made at the open dump provide evidence of burning of wastes in an open area (P.O.E.P. 1994, Photo 5.0). It is a common practice at the site to burn the waste in the trench (Loretto, 1994). The distance to the nearest residence is approximately 1.0 mile west of the site (P.O.E.P., 1994). The approximate number of people living relative to the site are shown in Table 2.0.

5.3 Soil and Air Conclusions:

The soil exposure and air pathways pose a minimal threat of the release of contaminants to nearby residents, school, and daycare center due to their location being greater than 0.5 mile from the site.

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6.0 SUMMARY AND CONCLUSIONS

The Jemez Pueblo has operated their open dump for approximately 20 years and continues to receive waste from tribal members. Throughout this period, the open dump has accepted an unknown quantity of waste at the 10 acre site, and the Pueblo has not kept formal records of the types and amounts of waste received. The sources have no type of run-on and run-off control, they are not lined, and open burning is a common occurrence at the site. The ground water and surface water may have been affected because of these practices at the open dump site. The potential for ground water contamination is due to the disposal practices, and the seepage of surface run-off and precipitation. The potential for surface water contamination is due to close proximity of the unnamed arroyo. Targets which may be impacted via surface water are the fishery, the wetlands along the Jemez River, and the endangered and threatened species which habitat the Jemez River territory. An additional target would be the Jemez River due to its usage by tribal members for ceremonial purposes.

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TABLES

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TABLE 1.0 FOUR - MILE WELL DISTRIBUTION

Distance Category (Miles)	Approximate Number of Wells	Type of Wells	Approximate Populations Served
0 - 1/4	0	NA	0
1/4 - 1/2	0	NA	7
1/2 - 1	1	Stockwell	11
1 - 2	6	2 Monitoring 1 Irrigation 2 Municipal 1 Unknown	1130
2 - 3	6	1 Irrigation 3 Unknown 2 Private/Domestic	200
3 - 4	8	1 Irrigation 6 Private/Domestic 1 Unknown	170

Sources: U.S.G.S. - Water Resources Investigations Report 89-4091, 1992; Jemez Water Tanks Preliminary Assessment, 1993

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TABLE 2.0 FOUR - MILE RADIUS POPULATION DISTRIBUTION

Distance Category (Miles)	Approximate Populations
0 - 1/4	0
1/4 - 1/2	7
1/2 - 1	11
1 - 2	1130
2 - 3	200
3 - 4	170

Sources: Jemez Water Tanks Preliminary Assessment, 1993; Shendo, 1993; U.S.G.S., 1972

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FIGURES

PA - Jemez Open Dump
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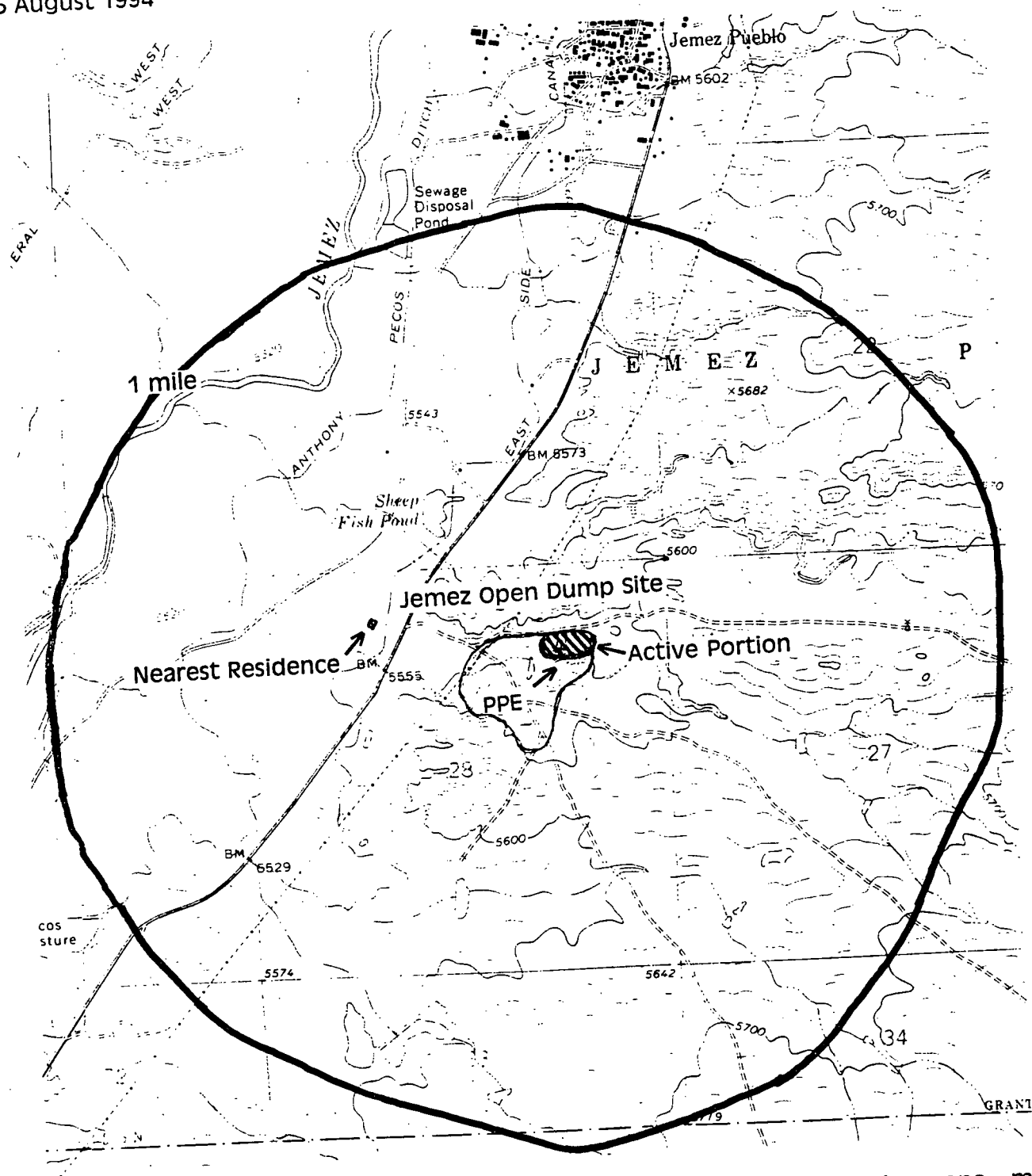


FIGURE 1.0 Vicinity map shows Jemez Open Dump Site, the active portion, one - mile distance ring, nearest residence, and PPE.

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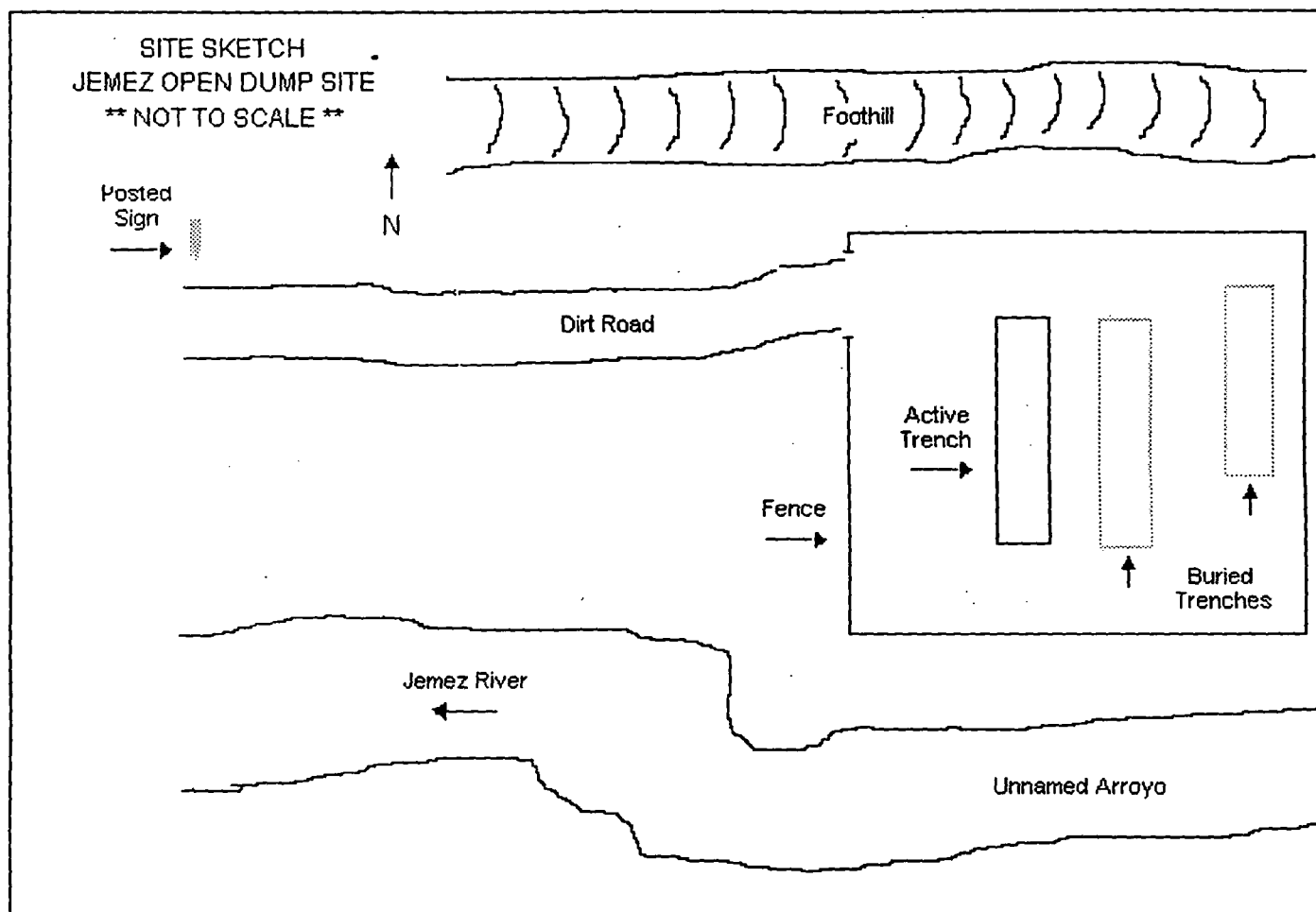


FIGURE 2.0: Site sketch of Jemez Open Dump distinguishing features on and near the site.
Note: Sketch is not to scale.

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LIST of REFERENCES

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PHOTO DOCUMENTATION

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PHOTO 1.0



Description: Photo shows two active trenches. These trenches are trending east-west, they are unlined, and have no surface run-on or run-off controls. Also shows a buried trench at the eastern edge of the open dump site.

Date/Time: 7-8-93, 1008 hrs.

Direction: Photo taken facing southwest.

Weather: Clear, slight breeze, approximately 75°F.

Photographer: Curtis L. Francisco, Environmental Scientist. *CLF*

Witness: Marian C. Medina, Environmental Technician. *MC*

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PHOTO 2.0



Description: Photo shows sign which is posted 0.5 mile west from the open dump site.

Date/Time: 4-5-94, 1018 hrs.

Direction: Photo taken facing east.

Weather: Partly cloudy, slight breeze, approximately 58 °F.

Photographer: Kendra L. Tso, Environmental Scientist *[Signature]*

Witness: Marian C. Medina, Environmental Technician. *[Signature]*

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PHOTO 3.0



Description: Photo shows the open dump site. The active trench and two buried trenches.

Date/Time: 4-5-94, 0944 hrs.

Direction: Photo taken facing north.

Weather: Partly cloudy, slight breeze, approximately 58 ° F.

Photographer: Kendra L. Tso, Environmental Scientist *KLT*

Witness: Marian C. Medina, Environmental Technician. *mcmm*

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PHOTO 4.0



Description: Photo shows the active trench and various amounts of waste. There is evidence of previous burning activity and improper soil covering.

Date/Time: 4-5-94, 0941 hrs.

Direction: Photo taken facing north.

Weather: Partly cloudy, slight breeze, approximately 58 ° F.

Photographer: Kendra L. Tso, Environmental Scientist. *KLT*

Witness: Marian C. Medina, Environmental Technician. *McM*

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PHOTO 5.0



Description: Photo shows a portion of the active trench. There is evidence of no liner and release to air.

Date/Time: 4-5-94, 0942 hrs.

Direction: Photo taken facing northeast.

Weather: Partly cloudy, slight breeze, approximately 58 °F.

Photographer: Kendra L. Tso, Environmental Scientist. *KL Tso*

Witness: Marian C. Medina, Environmental Technician. *McM*

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PHOTO 6.0



Description: Photo shows several buried areas of dumping which are outside of the 10 acre active open dump site. These areas are located approximately 500 feet west of the active open dump site.

Date/Time: 7-8-93, 1037 hrs.

Direction: Photo taken facing west.

Weather: Clear, slight breeze, approximately 75 ° F.

Photographer: Curtis L. Francisco, Environmental Scientist. *CLF*

Witness: Marian C. Medina, Environmental Technician. *McM*

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REFERENCE MATERIALS

REFERENCE:

**ASHBY, 1994
(Information on precipitation)**

CONTACT REPORT

**PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION
3939 SAN PEDRO NE
ALBUQUERQUE, NM 87110
(505) 884-0480**

CONTACT(S): Jim Ashby

TITLE: Asst. Climatologist

CONTACT(S):

TITLE:

CONTACT(S):

TITLE:

ADDRESS: Atmospheric Science Center
P.O. Box 60220, Reno, NV 85906

PHONE: 702-677-3106

DATE: 8-16-94

TIME: 1300 Hrs

POEP STAFF MAKING

CONTACT: Kendra L. Tso

TITLE: Environmental Scientist

SUBJECT: Precipitation measures

SITE NAME/REASON FOR

CONTACT: Data needed for Jemez Open Dump PA

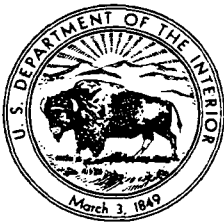
SITE

ID#: NM0000134007

SUMMARY: Mr. Ashby stated that the 2yr-24hr rainfall was 1.4 inches.

REFERENCE:

**FOWLER-PROPST, 1994
(List of Threatened and
Endangered Species within Jemez
Pueblo)**



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Ecological Services
Suite D, 3530 Pan American Highway, NE
Albuquerque, New Mexico 87107

March 16, 1994

Cons. #2-22-94-I-271

Ms. Kendra Tso
All Indian Pueblo Council
Pueblo Office of Environmental Protection
P. O. Box 3256
Albuquerque, New Mexico 87190

Dear Ms. Tso:

This responds to your letter dated February 25, 1994, requesting a list of federally listed, proposed to be listed, and candidate species that could occur within a 4 mile radius of the Jemez Pueblo. The information will be used as reference for a Preliminary Assessment of the Jemez Open Dump Site, located in Section 28, T.16 N., R.2 E., on Jemez Pueblo land, Sandoval County, New Mexico.

The New Mexico Ecological Services State Office of the U.S. Fish and Wildlife Service (Service) has used the information in your request to determine those species that could occur within the delineated area. The following endangered species could occur within a 4 mile radius of Jemez Pueblo: black-footed ferret, bald eagle, American peregrine falcon, and whooping crane, as well as the southwestern willow flycatcher, proposed as endangered with critical habitat. The Mexican spotted owl, listed as a threatened species, and the following category 2 candidate species, could also occur in the area: New Mexican jumping mouse, occult little brown bat, spotted bat, Goat Peak pika, hot springs cotton rat, ferruginous hawk, Apache northern goshawk, mountain plover, western snowy plover, white-faced ibis, loggerhead shrike, Jemez Mountain salamander, grama grass cactus, gypsum townsendia, Knight's milk-vetch, and Aztec milk-vetch.

Western burrowing owls (Athene cunicularia hypugaea) often inhabit small mammal burrows in prairie dog towns, ditch banks, and the banks of arroyos, and could occur in the area proposed for the dump site. Although not a listed species, the owls are protected under the Migratory Bird Treaty Act.

Category 2 candidate species are those for which the Service has information indicating that proposing to list is possibly appropriate, but for which substantial data on biological vulnerability or threats are not currently available to support the immediate preparation of such rules. They have no legal status under the Endangered Species Act and are included in this document for planning purposes only. However, the Service is concerned and would appreciate receiving any status information that is available or gathered on these species.

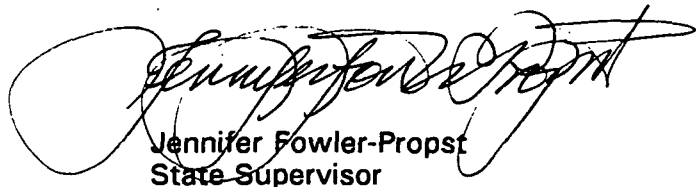
Ms. Kendra Tso

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The Service is concerned that wetlands, riparian areas, and the above listed species' sensitive habitats on or near the dump site are protected. We recommend that ground water monitoring be coordinated with the New Mexico Environment Department, and that you utilize the expertise of other State agencies that could assist the Jemez Pueblo in the protection of their natural resources. We suggest you contact the Jemez Pueblo Council for information concerning fish, wildlife, and plants of concern to the Pueblo.

If adverse impacts associated with the proposed action cannot be avoided, we would appreciate discussing your project in more detail. Also, this office is available should you desire site specific recommendations of mitigative measures that could provide enhanced protection to wildlife resources in the area. The Service appreciates the opportunity to provide information for the document you are preparing. If we can be of further assistance, or if you have any questions concerning our comments, please call Clint Bailey at (505) 883-7877.

Sincerely,



Jennifer Fowler-Propst
State Supervisor

Enclosure

cc: (wo/enc)

Governor, Jemez Pueblo, P.O. Box 100, Jemez, New Mexico 87024
Program Manager, New Mexico Environment Department, Ground Water Quality
Bureau, Santa Fe, New Mexico.

Species List
Jemez Open Dump Site
Sandoval County, New Mexico
March 16, 1994

Endangered

Black-footed ferret (Mustela nigripes) - This species is usually found in association with prairie dog towns in grassland plains and surrounding mountain basins up to 10,500 feet elevation. A survey for black-footed ferrets is required if the prairie dog town is over 80 acres for black-tailed prairie dogs and 200 hundred acres for white-tailed and Gunnison's prairie dogs. If the prairie dog town is greater than 1,000 acres, then the area should be evaluated for possible reintroduction of black-footed ferrets.

Authority: Dean Biggins, U.S. Fish and Wildlife Service, National Ecology Research Center, 4512 McMurray Avenue, Fort Collins, Colorado 80525-3400, (303) 226-9467.

American peregrine falcon (Falco peregrinus anatum) - The peregrine falcon occurs in areas with steep rocky cliffs in close proximity to water.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Bald eagle (Haliaeetus leucocephalus) - The bald eagle occurs in New Mexico mainly as a winter resident and migrant, with several nesting in the state. It is found in riparian areas adjacent to rivers, reservoirs, and ponds, and roosts in large trees which may be close to foraging areas. Rabbits, fish and waterfowl are the primary prey items.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Whooping crane (Grus americana) - Occupies the project area October through February. Roosts on gravel bars and islands in the Rio Grande. Feeds in cultivated fields and wetlands within several miles of the Rio Grande.

Authorities: James Lewis, U. S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103, (505) 766-3972, and Roderick Drewien, c/o Bosque del Apache National Wildlife Refuge, P.O. Box 1246, Socorro, New Mexico 87801, (505) 835-1828.

Proposed Endangered with Critical Habitat

Southwestern willow flycatcher (Empidonax traillii extimus) - This species inhabits thickets, riparian woodlands, pastures, and brushy areas. It is a sparrow sized, olive green flycatcher with a dark head, whitish throat, olive breast, and yellow belly. It has no eye ring and its wings have two white bars.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Threatened

Mexican spotted owl (Strix occidentalis lucida) - Occurs in varied habitat, consisting primarily of mature montane forest and woodland and shady canyons. In forested habitat, uneven-aged stands with a high canopy closure, high tree density, multilayered canopy, and a terrain with slopes greater than 15 degrees appear to be key habitat characteristics.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Category 2 Candidates

New Mexican jumping mouse (Zapus hudsonius luteus) - This species occurs at localized sites in the Sandia, Sangre de Cristo, Jemez, and Sacramento Mountains of New Mexico and the White Mountains of Arizona. It also occurs at four sites along the Rio Grande River. This jumping mouse requires a habitat that has a close proximity to permanent free flowing water with vegetation of a diverse composition. The flora consists of primarily grasses, forbs and willow, and tall dense cover with close proximity to higher dry ground that provides suitable nesting and hibernation sites.

Authority: Dr. David Hafner, New Mexico Museum of Natural History, 1801 Mountain Road, NW., Albuquerque, New Mexico 87104-1375, (505) 841-8837.

Occult little brown bat (Myotis lucifugus occultus) - This species is a montane dweller and roosts in natural caves, mine tunnels, hollow trees, or buildings.

Authority: Scott Altenbach, University of New Mexico, Department of Biology, Albuquerque, New Mexico 87131, (505) 277-3411.

Spotted bat (Euderma maculatum) - This bat is found in several national forests in New Mexico. This species tends to occur in remote areas, selecting specialized roosting sites. The presence of streams and nearby cliffs or steep hillsides with loose rocks may be habitat for this bat.

Authority: Scott Altenbach, University of New Mexico, Department of Biology, Albuquerque, New Mexico 87131, (505) 277-3411.

Goat Peak pika (Ochotona princeps nigrescens) - A small (162-216 mm long), tailless lagomorph with short, round ears, commonly found in talus slopes at high elevations. The Goat Peak pika occurs in lava boulders and rocks, and has a characteristically dark pelage.

Authority: Dr. James S. Findley, Biology Department, University of New Mexico, Albuquerque, New Mexico, 87131, (505) 277-3411.

Hot Springs cotton rat (Sigmodon fulviventer goldmani) - This species is distinguished by the mixture of black and pale buff ("salt and pepper") hairs of upperparts, and the buff belly. The rat has small tail scales and a heavily haired tail.

Authority: Unknown.

Ferruginous hawk (Buteo regalis) - Found almost statewide during migration. This bird seems to key in on wide open grasslands and prairies, especially for nesting.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Apache northern goshawk (Accipiter gentilis apache) - A heavy bodied accipiter with a dark grey-blue back, grey underparts, dark crown, broad white eye stripe, barred tail, and white undertail coverts. This species prefers dense coniferous forests, pine-oak woodlands, and other wooded areas.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Mountain plover (Charadrius montanus) - This species is primarily found in short grass prairies often associated with prairie dog towns. Nest sites are chosen in flat country with sparse and low-lying vegetation. This bird feeds exclusively on insects; primarily beetles, grasshoppers, and crickets.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Western snowy plover (Charadrius alexandrinus nivosus) - Inhabits flat sandy areas, alkali flats, and areas near water which are devoid of vegetation or have very little vegetation.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

White-faced ibis (Plegadis chihi) - This species inhabits salt and freshwater marshes, shallow margins of muddy pools, ponds, and rivers.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Loggerhead shrike (Lanius ludovicianus) - This species inhabits grass/shrubland, open woodland, and chaparral. The bird is rare to fairly common at lower and locally at middle elevations; casual at higher elevations. Resident statewide.

Authority: Steve Lewis, U.S. Fish and Wildlife Service, Bishop Henry Whipple Federal Building, One Federal Drive, Fort Snelling, Minnesota, 55111-4056, (612) 725-313.

Jemez Mountain salamander (Plethodon neomexicanus) - This species only occurs in the Jemez Mountains where it prefers densely wooded, shady canyons on north-facing slopes at elevations of 2,190 to 2,800 meters. Its habitat is characterized by coniferous forest having multistoried stands, moderately closed canopy, large trees, and stand decadence indicated by standing dead trees and fallen logs.

Authority: Charlie Painter, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9901.

Grama grass cactus (Pediocactus papyracanthus) - Located primarily in northern, central, and southern New Mexico and central Arizona. At one time, this species may have had a considerably larger range and been more abundant. Increased grazing has decreased the numbers of cactus and perhaps reduced its range. Plants occur in open flats in grasslands and pinyon-juniper woodlands at 5,000-7,300 feet elevation. The plants commonly grow in sandy-gravelly and occasionally in gypseous soils.

Authority: Robert Sivinski, New Mexico Energy, Minerals and Natural Resources Department, Forestry and Resources Conservation Division, P.O. Box 1948, Santa Fe, New Mexico 87504-1948, (505) 827-7865.

Gypsum townsendia (Townsendia sp. nov.) - This plant grows on nearly pure gypsum at White Mesa, one-half mile south of San Ysidro, Sandoval County, New Mexico.

Authority: Dr. Tim Lowrey, Biology Department, University of New Mexico 87131, (505) 277-3411.

Knight's milkvetch (Astragalus knightii) - This plant is found on open sandstone ledges and cliff terraces, in pinyon pine and juniper woodlands and grama-galleta grassland at 5,750-6,000 feet elevation. Population localities are found along the upper Rio Puerco drainage around the escarpments of the Mesa Pietra.

Authority: Robert Sivinski, New Mexico Energy, Minerals and Natural Resources Department, Forestry and Resources Conservation Division, P.O. Box 1948, Santa Fe, New Mexico 87504-1948, (505) 827-7865.

Aztec milkvetch (Astragalus proximus) - A perennial with thin upright stems 6-18 inches tall. Leaves are pinnately compound, linear and smooth on the upper surface. Leaflets occur in divisions of 7-11. Flowers are white tinged with pink, about 1/5 inch long, and bloom from April to July. Seed pods are smooth, short-stipitate and oblong in shape. This species occurs in northern San Juan County, New Mexico, and adjacent Colorado, from 5,000 to 7,000 feet in elevation.

Authority: Mr. Robert Sivinski, New Mexico Energy, Minerals and Natural Resources Department, Forestry and Resources Conservation Division, P.O. Box 1948, Santa Fe, New Mexico, 87504-1948, (505) 827-7865.

REFERENCE:

FRAGUA AND SHENDO, 1993
(Site reconnaissance information)

CONTACT REPORT
=====

PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION
ALL INDIAN PUEBLO COUNCIL
3939 SAN PEDRO NE., SUITE "B"
ALBUQUERQUE, NEW MEXICO 87110
(505) 884-0480

CONTACT (S) : Roger Fragua **TITLE :** Tribal Administator
CONTACT (S) : Leonard Shendo **TITLE :** Tribal Maintenance
CONTACT (S) : _____ **TITLE :** _____

ADDRESS OF THE PERSON/COMPANY CONTACTED :

Pueblo of Jemez

P.O. Box 100 Jemez, NM 87024

PHONE : (505) 834-7359 **DATE :** 2/19/93 **TIME :** 9:00 am

POEP STAFF MEMBER MAKING

THIS CONTACT : Syed Rizvi **TITLE :** Sr. Environmental Engineer

SUBJECT : Site Reconnaissance Information

PROJECT/SITE NAME : Jemez Water Tanks (PA)

SUMMARY :

There are total of 4 tanks.

Tank #1: Not in use, capacity 100,000 gallons, old, not in use since 1978.

Tank #2: in use, capacity 250,000 gallons, light brewish yellow, sludge.

Tank #3: in use, capacity 250,000 gallons, brownish yellow sludge

Tank #4: Just a storage tank to hold the Owl Spring Water for blending purposes

Problem with the entire system; bad smell, sulfur smell. That is the reason

Owl Spring water is blended. Periodic Chlorination is also performed prior

to distribution.

Continued to Page 2

There is presence of brownish yellow sludge in the tanks. Tanks are cleaned twice a year and sludge is washed out on the surface soil next to the tanks. Tanks were in operation as follows:

Tank #1 From 1963 to 1978 closed and not in use
Tank #2 From 1978 to date in use
Tank #3 From 1985 to date in use
Tank #4 is just like a holding tank for owl spring
to date, no proper analysis have been performed
on the system;

but there is presence of sludge due to inorganic/organic salts and it poses a to environment and health. There is only one well that is an operation and water from owl spring is blended in that - well water distribute in the Pueblo.

Use of land is 1-mile is residential and partially agricultural

Black Collidial Particles have been seen in the water.

There are two problems.

1. the entire water distribution system that has hazardous substance in it.
2. the contaminated soil, after washing frpm the tanks.

Also, no well-head protection area available near the site.
No drinking water intakes from surface water within 15 downstream miles of the site.

Sued P. M.

REFERENCE:

GACHUPIN, 1994
(General information of dump
and water system)

CONTACT REPORT

**PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION
3939 SAN PEDRO NE
ALBUQUERQUE, NM 87110
(505) 884-0480**

CONTACT(S): Matthew Gachupin **TITLE:** Lt. Governor

CONTACT(S): **TITLE:**

CONTACT(S): **TITLE:**

ADDRESS: Pueblo of Jemez
P.O. Box 100, Jemez, New Mexico, 87024

PHONE: 505-834-7359

DATE: 05/31/94

TIME: 1100 Hrs

POEP STAFF MAKING

CONTACT: Kendra L. Tso

TITLE: Environmental Scientist

SUBJECT: History of Jemez Open Dump

SITE NAME/REASON FOR

CONTACT: Data needed for Jemez Open Dump PA

SITE

ID#: NM0000134007

SUMMARY: Lt. Governor Gachupin stated that the two buried trenches were active for approximately 10 years. The dimensions are the same as the current active trench, 150 feet long, 150 feet wide, and 15 feet deep. The wastes that were dumped into the two buried trenches are household wastes, durable goods, and organic matter. There are three or four developments approximately 1.0 miles west from the site. These developments are connected to the pump system. Jemez Pueblo has a pump system that draws water from the alluvial. There is a well being drilled approximately 1.0 miles east from the site.

REFERENCE:

HAWLEY, 1994
(Geological information)



Information: 505/835-5420
Publications: 505/835-5410
FAX: 505/835-6333

New Mexico Bureau of Mines & Mineral Resources
Socorro, NM 87801

A DIVISION OF
NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY

May 17, 1994

Mr. Charles M. Sanchez
Senior Environmental Scientist
Superfund Section
Pueblo Office of Environmental Protection, AIPC
P.O. Box 3256
Albuquerque, NM 87190

Dear Charles:

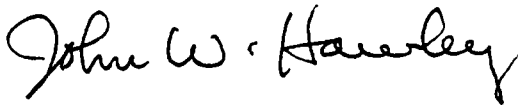
This letter is in response to your request for information on geology as related to environmental concerns at the active landfill site located in the SW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ and SE $\frac{1}{4}$, NW $\frac{1}{4}$, NE $\frac{1}{4}$, Section 28, T16N, R2E on the Jemez Pueblo Grant (Sandoval County, NM). My comments on site environmental geology are based on (1) field observations made on May 12, 1994 when Mr. Curtis Francisco and Ms. Kendra Tso (POEP), Mr. John Rogers (UNM graduate student) and I visited the area; (2) a review of cited geologic and hydrologic reports on the area; and (3) additional professional experience gained since 1977, when I first started working in the Jemez Valley area of the northern Albuquerque Basin. Mr. Rogers has previously collaborated with Curtis Francisco on other geological investigations and he is currently doing graduate research on geology of the Jemez River valley upstream from the Pueblo.

Published information on the geology and water resources of the Pueblo area is summarized by Craigg (1992 and 1984). My general interpretation of landfill site environmental geology is illustrated by the attached diagrammatic hydrogeologic cross section extending through the site from the Jemez River to Stock Well No. 1 (SW $\frac{1}{4}$, NW $\frac{1}{4}$, NE $\frac{1}{2}$, Section 27, T16N, R2E; Well 27.213 of Craigg). This well is located 0.9 mi east of the landfill. In addition to the fenced-in site (less than 10 acres), with the presently active landfill trench, there is a much larger area of the valley floor (about 80 acres) south of the arroyo channel that has been used for long-term surface dumping. This area extends west from the middle of Section 27 to the middle of Section 28 (T16N, R2W).

The landfill (elev. about 5590 ft) is located on the floor of a gently sloping (1 to 2%) arroyo valley that merges with the Jemez River floodplain about one mile to the west (elev. 5510 ft). The depth of the active landfill trench is about 10 feet, and I estimate that the elevation of the regional water table is about 5530 ft (or approximately 50 ft below the base of the landfill). The major aquifer in this part of the Pueblo is the Zia Formation (Tsz), the basal subdivision of the Santa Fe Group. The Zia here is primarily sand and sandstone

of eolian (windblown) origin. Stream terraces, cut on the Zia Formation and capped by ancient gravel and sand deposits of the ancestral Jemez River, form the valley walls in the landfill area. The thickness of arroyo valley fill (AVF) at the site is unknown, but is probably no more than 30 to 40 ft. Jemez River alluvium (JR) to the west is reported to be locally as much as 85 ft thick. Valley-fill alluvium exposed in the landfill trench and arroyo walls is primarily sand with a few thin layers loamy sand. The lower part of the arroyo valley fill is much coarser grained, with basal channel gravel deposits being present in many places. Clay-rich beds probably do not occur in the vadose or shallow saturated zones in this area. Site-specific information on hydrogeology and unsaturated-flow conditions (based on drill-hole, geophysical, geochemical, and geohydrologic data) will be required before more detailed characterization of this area can be made.

Sincerely,



John W. Hawley, Ph.D.
Senior Environmental Geologist &
Manager of Albuquerque Office
2808 Central Ave. S.E.
Albuquerque, NM 87106
Tel. (505) 255-8005
FAX (505) 255-5253

cc: Dr. C. E. Chapin, Director and State Geologist, NMBMMR
Mr. Daniel L. Sanchez, Secretary/Treasurer, AIPC
Ms. Derrith Moore, Asst. Director, POEP/AIPC
Mr. Matthew Gauchapin, Lt. Gov., Jemez Pueblo
✓ Ms. Kendra Tso, Environmental Scientist, POEP
Mr. Curtis Francisco, Environmental Geologist, POEP
Mr. Thaddeus L. Garcia, Environmental Scientist, POEP

References

- Craig, S.D., 1984, Hydrologic data on the Pueblos of Jemez, Zia, and Santa Ana, Sandoval County, New Mexico: U.S. Geological Survey, Open-File Report 84-460, 37 pp.
- Craig, S.D., 1992, Water resources on the Pueblos of Jemez, Zia, and Santa Ana, Sandoval County, New Mexico: U.S. Geological Survey, Water-Resources Investigations Report 89-4091, 122 pp.
- Galusha, Ted, 1966, The Zia Sand Formation, New Early to Medial Miocene beds, New Mexico: American Museum Novitates, No. 2271, 12 pp.
- Hawley, J.W., compiler, 1978, Guidebook to Rio Grand rift in New Mexico and Colorado: New Mexico Bureau of Mines and Mineral Resources, Circular 163, pp. 177-185, charts 1 and 2
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- Smith, R.L., Bailey, R.A., and Ross, C.S., 1970, Geologic map of the Jemez Mountains, New Mexico: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-571, scale 1:125,000
- Woodward, L.A. and Ruetschilling, R.L., 1976, Geology of San Ysidro Quadrangle, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Geologic Map 37, scale 1:24,000.

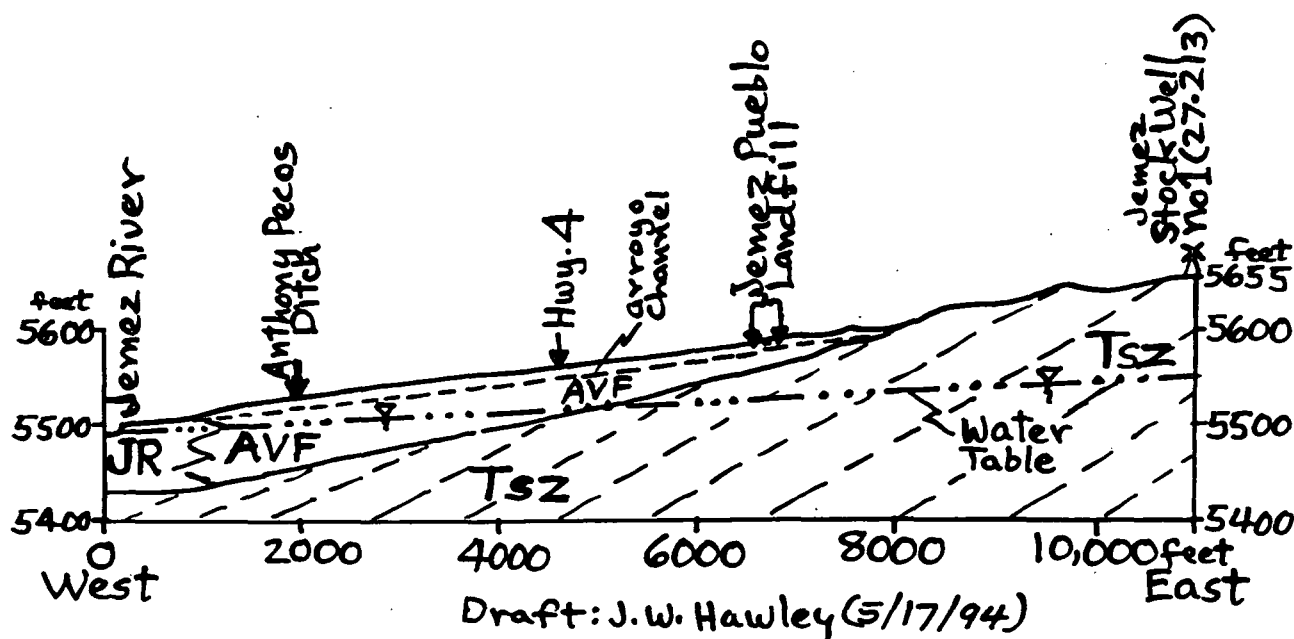
KEY TO GEOLOGIC UNITS ON HYDROGEOLOGIC CROSS SECTION THROUGH JEMEZ LAND FILL AREA

Jemez River Valley Fill

- JR Channel and floodplain deposits of inner valley of Jemez River; gravel and sand interbedded with lesser amounts of sandy loam, salt and clay; probably less than 70 ft thick in most places.
- AVF Arroyo-Valley fill and alluvial-fan deposits that spread out from tributary valleys onto the floodplain of Jemez River; unit intertongues with "JR" at river-valley margin.

Intermontane Basin Fill-Northern Albuquerque Basin

- Tsz Zia Formation-Low Santa Fe Group; sandy basin-fill deposits that are partly indurated; primarily ancient sand dune (eolian) material in the Zia Pueblo landfill area.



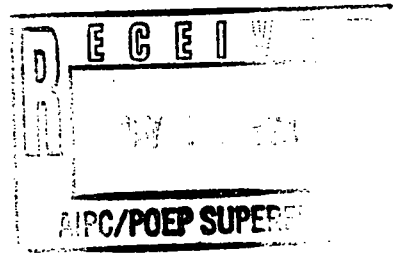
REFERENCE:

**JARAMILLO, 1994
(Flood Hazard Information)**



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1580
ALBUQUERQUE, NEW MEXICO 87103-1580
FAX (505) 766-2770



May 19, 1994

Engineering and Planning Division
Planning Branch

Ms. Kendra Tso
Environmental Scientist
Pueblo Office of Environmental Protection
P.O. Box 3256
Albuquerque, New Mexico 87190-0480

Dear Ms. Tso:

The U.S. Army Corps of Engineers, Albuquerque District, has completed the flood hazard evaluation that you requested for the Jemez Open Dump site located approximately one mile south of Jemez Pueblo, New Mexico. The site is located at the mouth of an unnamed wash. Based on the site map that you provided, we have determined by approximate methods that the site is located in the unnamed wash 100-year floodplain.

Please call Gary Lopez of my staff at 766-3119 if you need additional information or have any questions concerning our evaluation.

Sincerely,

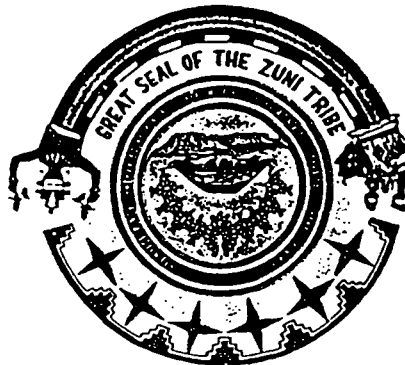
Frank Jaramillo, P.E.
Chief, Hydrology and Hydraulics Section

PLEASE SIGN IN

PUEBLO OF ZUNI

ROBERT E. LEWIS
Governor
PESANCIO LASILOO
Lt. Governor
JOSEPH DISHTA
Hd. Councilman
VAL R. PANTEAH, SR.
Councilman

P. O. BOX 339
ZUNI, NEW MEXICO 87327



505-782-4481

EDISON R. WATO, SR.
Councilman
AUGUSTINE A. PANTEAH
Councilman
CHARLOTTE T. BRADLEY
Councilwoman
OWEN R. BOBELU
Councilman

In reply refer to:

Zuni, New Mexico

PURPOSE: POEPA meeting

DATE: 8 June 94 TIME: 10:25

NAME/AGENCY	ADDRESS/PHONE NUMBER
1. <u>Marian Medina AIPC/POEP</u>	<u>PO Box 3252 Albany NM 854-0481</u>
2. <u>DERRITH R. MOORE AIPC/POEP</u>	<u>" " " " " "</u>
3. <u>KENORA L. TOW AIPC/POEP</u>	<u>" " " " " "</u>
4. <u>LLOYD A. EDINA AIPC/POEP</u>	<u>" " " " " "</u>
5. <u>CHARLES SANCHEZ AIPC/POEP</u>	<u>" " " " " "</u>
6. <u>Strallie Eduakix Zuni Utility Dept.</u>	<u>P.O. Box 339 782-5654</u>
7. <u>Jerrald Tsalata Zuni IHS</u>	<u>PO Box 467 782-4431</u>
8. <u></u>	<u></u>
9. <u>Michael Prince N. Natl. Water Rights</u>	<u>782-5591</u>
10. <u>STEVEN D. DAVIS</u>	<u>P.O. Box 369 Zuni 782-5592</u>
11. <u>Ernest Mochel</u>	<u>" " " " " 5591</u>
12. <u>LARRY Livingston NATURAL RESOURCES</u>	<u>" " " 5592</u>
13. <u>Shirley Bellson</u>	<u>" " " 782-5591</u>
14. <u>H. B. Simpson</u>	<u>" " " 782-5591</u>
15. <u></u>	<u>" " " 782-5591</u>
16. <u>OWEN R. BOBELU</u>	<u>Zonem Office Zuni 782-4481</u>
17. <u>AUGUSTINE PANTEAH</u>	<u>Ofc of Gov's ZUNI 782-4481</u>
18. <u>Edison R. Wato</u>	<u>Ofc of Gov's Zuni 782-4481</u>
19. <u>PESANCIO W LASILOO Lt Gov.</u>	<u>P.O. Box 339 Zuni, 782-4481</u>
20. <u>Robert E. Lewis Governor</u>	<u>" " " " " "</u>

REFERENCE:

**JEMEZ WATER TANKS PRELIMINARY
ASSESSMENT, 1993
(Information on wells and
population)**



**ALL INDIAN PUEBLO COUNCIL
PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION**

**PRELIMINARY ASSESSMENT
JEMEZ WATER TANKS
PUEBLO OF JEMEZ
SANDOVAL COUNTY, NEW MEXICO**

**SUBMITTED TO:
MARK SATTERWHITE
SUPERFUND INDIAN COORDINATOR
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI, DALLAS, TEXAS**

**SUBMITTED BY:
THE ALL INDIAN PUEBLO COUNCIL
PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION**

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1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1985 (SARA), and through a cooperative agreement entered into with the United States Environmental Protection Agency (EPA), the All Indian Pueblo Council / Pueblo Office of Environmental Protection (AIPC/POEP) conducted a Preliminary Assessment (PA) of the Jemez Water Tanks site, at the Pueblo of Jemez, New Mexico. The purpose of this investigation was to collect information concerning conditions at the Jemez Water Tanks sufficient to assess the threat posed to human health and the environment. At this site, the ground water is contaminated with Arsenic, Copper, Manganese and some inorganic or organic salts which are deposited in the tanks making a brownish-yellow sludge (Ref. 4, 14, page 1,4). This assessment will determine the need for any additional CERCLA/SARA or other appropriate action. The Pueblo of Jemez believes that the site poses considerable threat to human health and environment and has requested assistance from POEP. The scope of the investigation included review of available file information and records, a comprehensive target survey and study of environmental impacts. An offsite reconnaissance was conducted on February 19, 1993.

2.0 SITE DESCRIPTION, OPERATIONAL HISTORY AND WASTE CHARACTERISTICS

2.1 Location

Jemez water tanks, comprised of two tanks and a distribution line system, are located at the west side of the Pueblo of Jemez in New Mexico. The water tanks are in a rural area within the Pueblo of Jemez. The geographic coordinates of the site are 35° 37' 25" N latitude and 106° 43' 07" W longitude (Ref. 12). The site is located in the southwest corner of Section 15, Township 16 North, Range 2 East on the Jemez Pueblo Grant (Ref. 12). To reach the site, take I-25 North from Albuquerque towards the town of Bernalillo, take exit 242 towards Highway 44 West. After approximately 21 miles, take Highway 4 North. After approximately 4 miles on Highway 4, you will reach the Pueblo of Jemez. The tanks, #2 and #3, are located on the east side of the Pueblo of Jemez, on top of the hill. The site is located on top of the hill at higher elevation, it is assumed that the site is not within any specific flood plain.

The Pueblo of Jemez is characterized by a mild temperature climate. Summers are warm but not humid with daily average temperatures reaching 80-90 degrees Fahrenheit or higher. The winter months are mild to very cold with daily average temperatures of 30-40 degrees Fahrenheit (Ref. 11). The average mean annual precipitation for the area is approximately 16.94 inches (Ref. 5)

2.2 Site Description

There are a total of three water tanks in the Pueblo of Jemez. One tank (tank #1) was closed in 1978 and has not been used since 1978 (Ref. 4, page 2). The other two tanks, tank #2 and tank #3, have been used since 1978 and 1985 respectively (Ref. 4, page 1). These two tanks primarily function as drinking water storage and supply reservoirs for the entire Pueblo of Jemez. These tanks are located on relatively flat terrain on top of a hill, that slopes gently towards the west-southwest side into the Jemez valley. There are two arroyos, approximately 200 yards southeast of the tanks (tank #2 and tank #3), called Houpo Wawa (South Arroyo) and Canal Lane Arroyo (Ref. 11). The runoff from the nearby foot hills, resulting from rain and snow, flows adjacent to the tanks into these arroyos and finally to the Jemez River. There is a brownish-yellow sludge present all the time in these tanks causing a bad sulfur smell. This sludge formation is due to the presence of some inorganic/organic salts which poses considerable threat to human health and the environment (Ref. 4).

These tanks are cleaned twice a year and the residue in the tanks is washed out on the surface soil adjacent to the tanks. The soil around the tanks is contaminated and has never been cleaned or removed. This area is open to the public (Ref. 4). These water tanks have a water holding capacity of 250,000 gallons each. It is estimated that the one percent of the capacity of the tank (2500 gallons) is the sludge deposited at the bottom of each tank (Ref. 4). The total waste quantity for contaminated sludge for both the tanks is 5,000 gallons. This contaminated sludge is washed out of the tanks and spread over 200 feet around the tank. The area of contaminated soil is 40,000 sq.ft for each tank. The total contaminated soil area around both of the tanks is estimated at 80,000 sq.ft. (Ref. 17).

2.3 Operational History and Waste Characteristics

The Jemez water tanks are owned and operated by the Pueblo of Jemez. Originally, there was only one tank (tank #1) that was built in 1963 and was in operation until 1978 (Ref. 4). Tank #1 was closed in 1978 because of the constant formation of brownish-yellow sludge in the tank and bad smell of sulfur (Ref. 4). Tank #2 and tank #3 started operating in 1978 and 1985, respectively, and are still in operation. The Pueblo of Jemez is still experiencing the problem with the drinking water supply system which is contaminated with hazardous substances of high toxicity, persistence, and known carcinogenicity such as Arsenic, Copper, Manganese and some other inorganic / organic salts (Ref. 1). Recent analytical analysis by Bureau of Indian Affairs (BIA) has shown some elevated levels of Arsenic, Copper and Manganese (Ref. 1).

There is only one well that supplies water to these tanks for distribution through the Pueblo of Jemez. Because of the problem of contaminated sludge formation in the water supply system and a significant growth in the Pueblo's population, the Pueblo of Jemez is blending natural spring water from the "Owl Spring" into the water system (Ref. 4, 17). Owl Springs is located 2 miles west of the Pueblo of Jemez. Water from this Spring is stored in a holding tank (blue tank #4) and then mixed with the well water, the single water well in that area, called pump house well, at a ratio of 1:1 and transferred to tank #2 and tank #3 for distribution. Some of the houses get their water through the transfer line before it reaches to tank #2 or tank #3 (Ref. 11). Periodic chlorination is also performed at the pump house prior to water distribution (Ref. 4, page 1).

There are total of two tanks, each having a capacity of 250,000 gallons, serving the entire population of 1700 in the Pueblo of Jemez (Ref. 4). A brownish-yellow sludge is formed inside the bottom of the tanks. The tanks are cleaned twice a year and the sludge is washed out onto the surface soil adjacent to the tanks (Ref. 4). The contaminated sludge is washed out covering 200 feet soil around each tank. It gives a contaminated soil area of 40,000 square feet for each tank. The total area of contaminated soil is 80,000 square feet for both of the tanks. The quantity of contaminated sludge is estimated as 1 % of the capacity of each tank. This gives a total sludge waste quantity of 5,000 gallons ($2,500 \times 2 = 5,000$) for both the tanks. The contaminated soil around the tanks is not fenced, therefore, access to the area is unrestricted. To date, no extensive sampling or response action to determine the cause of sludge formation in the tanks and associated distribution system has occurred at the site (Ref. 11).

3.0 GROUND WATER PATHWAY

3.1 Hydrogeologic setting

The Jemez water tanks are located in the southwest corner of Section 15, Township 16 North, Range 9 East on the Jemez Pueblo Grant (Ref. 12). The site is located within the Albuquerque structural basin, a broad structural depression associated with the Rio Grande Rift. The basin is bounded on the east by the Sandia uplift and on the west by faults associated with the Rift and buried on the north by the Jemez Mountain volcanics. This basin has been filled by coalescing alluvial fans which have deposited as much

as 4,000 feet of sand, silt, gravel and clay derived primarily from the Sandia Mountains and San Juan basin from the west of Albuquerque basin (Ref. 16, page 1). The deposition of these sediments by streams has resulted in beds of limited horizontal and vertical extent. Most recent basin sediments of late Pliocene or Pleistocene age are called the "Ancha Formation" and are characterized by sediments coarser than any other formation in that area and are unconsolidated. The arroyos and river valleys contain recent sandy alluvium which is generally shallow, though may be as deep as 90 to 100 feet in the Jemez River valley. There is no karst topography at the site, however, karsting may occur to the south in the Owl Springs area (Ref. 16, page 1).

Surface drainage at the site is into the Houpo Wawa (South Arroyo) and to Canal Lane Arroyo and finally into the Jemez River which lies within the west boundary of the site (Ref. 11). Ground water flow is generally towards the south or southeast and towards the Jemez River which is sometimes gaining water from the Santa Fe group aquifer (Ref. 8, page 2, 3, and Ref. 16, page 1). Recharge to the ground water near the site is primarily from torrential storm flows in the arroyos. There is also a direct recharge to the ground water in that area through the volcanic units associated with the Jemez Mountains (Ref. 16, page 1).

The Jemez River is cut into an older filled channel containing thick gravel beds favorable for development of large capacity wells (Ref. 8, 16, page 3). The sediments of the Santa Fe group into which this buried channel has been entrenched yield large quantities of water only rarely, as proven by previous test drilling (Ref. 16, page 3). The drilling data and excavations at Jemez Canyon Dam near the mouth of Jemez River, and test holes drilled at a bridge site on the Jemez River north of Jemez Springs indicates that the buried channel of the Jemez River extends at least 55 feet below river level at these locations (Ref. 16). A thick section of gray limestone of Pennsylvanian age, west of the Jemez River valley, is the only important bedrock aquifer in the region. Several springs, including part of Owl Spring, discharge water of fair chemical quality from the limestone (Ref. 6, page 1,2). Owl spring (16N. 2E. 7.424, U. S. G. S. location system) is located approximately 2 miles northwest of Jemez Pueblo, at the mouth of Tecolote Canyon in the south end of the Nacimiento Mountains (Ref. 6, page 2). Owl Spring has been a source of drinking water for Pueblo of Jemez since 1953 when the effort was made to store it and to blend it with the well water (Ref. 6, page 2, and Ref. 15, page 1).

Depth to ground water varies from near the surface in the Jemez River valley to some hundred feet on the surrounding ridgetops and mesas. Depth to ground water in that area near the site is in the range of 80 to 90 feet (Ref. 6, page 10). There are no well-head protection areas near the site (Ref. 4, page 2).

3.2 Ground Water Targets

The total population of Jemez Pueblo is 1700 (Ref. 3). The entire population receives their drinking water either from the water tanks or through the pump house distribution line. There is only one well at the pump house, called the pump house well, which the Owl Spring water is also blended to supply water to the entire Pueblo. The whole water supply system is contaminated with some heavy metals resulting in the formation of brownish-yellow sludge found in the pipe lines and at the bottom of the supply tanks (Ref. 4). The entire population of Jemez Pueblo is considered a primary target. Sometimes this water has black colloidal particles in it and a strong smell of sulfur (Ref. 4, 7, page 2). Some people have started drinking water directly from Owl Spring and Paliza Spring (Paliza Spring is located in the Santa Fe National Forest approximately 10 miles northeast from the Pueblo of Jemez). There are 8 private drinking water wells within the 4-mile radius. These wells are located outside the Pueblo boundaries in the Grants of San Ysidro and Canon De San Diego. The average depth of the aquifer in that area is between 50 to 90 feet (Ref. 6, 15).

Table 1. provides the population served in each distance ring.

TABLE 1.

Primary/Secondary Target Population Distance Categories	Population Served
0 to 1/4 mile	30
1/4 to 1/2 mile	200
1/2 to 1 mile	900
1 to 2 miles	200
2 to 3 miles	200
3 to 4 miles	170
The entire population of 1700 is the	Total 1700
Primary Target Population	

The population in distance categories is served equally by pump house well and Owl Springs.

3.3 Ground Water Conclusions

A release of hazardous substances from the ground water to the Jemez water distribution system, including the tanks, is suspected due to the brownish-yellow sludge formation in the system. The presence of blackish colloidal particles in the water and strong sulfur smell also indicates the poor water quality, makes this water not suitable for drinking (Ref. 4, page 1, and Ref. 7, page 2). The Pueblo of Jemez believes that the ground water and it's distribution system poses considerable threat to human health and environment. Assistance was requested from the All Indian Pueblo Council, AIPC, (letter from the Governor of Jemez Pueblo to the Chairman AIPC dated October 18, 1991, Ref. 2) and from EPA (letter from the Chairman of AIPC to the EPA dated November 18, 1991, Ref. 13). The analytical data also indicates the contamination of water from metals such as Arsenic, Copper and Manganese, resulting in the formation of brownish-yellow sludge (Ref. 1). There is only one drinking water well, the pump house well, supplying water for the entire Pueblo. Water from Owl Spring is blended with this well in the pump house to match the demand of the Pueblo for drinking water and also to reduce the black particles in the system. This system needs a proper removal / clean up and a permanent solution to the problem for better operations and monitoring to avoid any future contamination in the water supply systems.

4.0 SURFACE WATER PATHWAY

4.1 Hydrologic setting

Overland drainage from the site flows west into the two arroyos called Houpo Wawa (South Arroyo) and Canal Lane Arroyo. These arroyos are located next to tank #2 and tank #3 respectively, within a

distance of 200 yards (Ref. 11). There is a series of low lying hills near the tanks. Run off, caused by rain and snow, flows from these hills down through the contaminated surface soil into the arroyos and into the Jemez River located only 2 miles west of the tanks (Ref. 11). These arroyos have a low flow rate during winter months but a medium to high flow rate during summer months. A mean average flow rate of these arroyos could range from 5 to 10 cubic feet per second (Ref. 11). There are several ditches within a 4-mile radius of the water tanks merging into the Jemez River.

4.2 Surface Water Targets

There are no drinking water intakes from surface water within 15 downstream miles of the site (Ref. 4, page 2). Few people drink water from the Owl Springs, located 2 miles northwest of Jemez Pueblo. Owl Springs is not located along the surface water pathway. All of the residents are served by the water supply system maintained by the Pueblo of Jemez (Ref. 3). There is only one river, the Jemez River, within a 15-mile radius from the site. The Jemez River is located approximately 2 miles west of the site and has moderate flow rate of 76.5 cubic feet per second (Ref. 10, page 1). The Jemez River is used for recreational fishing (Ref. 17). Aquatic species commonly caught include Rainbow trout and German brown (Ref. 17). There are several active wetlands within 15 downstream miles of the site. The nearest wetland (approximately 50 acres, 0.25 frontage) is located approximately 3.50 miles downstream from the site, west of the pump house, on the Jemez River (Ref. 17). Two Federally designated endangered species, the Whooping Crane and the Black-Footed Ferret, can be found in that area (Ref. 9, 17).

4.3 Surface Water Conclusions

A release of contaminants to the surface water is suspected because of the existence of two arroyos, South Arroyo and Canal lane Arroyo, next to contaminated soil area near the tanks. Drainage of water from the hills through the contaminated soil into the arroyos occurs. There are several active wetlands located 15 miles downstream from the site. Two Federally designated endangered species are also found in that area. The Jemez River is used for recreational fishing. Primary targets include the fishery, the wetlands and the potential habitats of endangered species along the wetlands.

5.0 SOIL EXPOSURE AND AIR PATHWAYS

5.1 Physical Conditions

Whenever the water tanks are cleaned to remove the sludge, the brownish-yellow contaminated sludge is washed out onto the near surface soil contaminating the area around the water tanks. Usually, the washing is done twice a year (Ref. 4). As a result, the sludge is deposited after every washing as evidenced by brownish-yellow staining of the surface soil (Ref. 11). The site is open to the public.

5.2 Soil and Air Targets

There are no residents or workers onsite except for the maintenance staff for the water tanks (Ref. 17). There are approximately 30 people living within 1/4-mile northwest of the site (Ref. 3). The nearest house, with 8 residents, is approximately 700 feet from the site (Ref. 3, 17). The nearest school is located 0.50 mile west of the site (Ref. 17). The total population within a 4-mile radius of the site is approximately 1700 (Ref. 3). There is a 50-acre wetland located on the west side approximately 3.50 miles from the site (Ref. 17). There is also the possibility that terrestrial sensitive environments of the Federally designated endangered Black-footed Ferret and Whooping Crane habitats may be found within the boundaries of the Jemez water tanks, as the species are known to inhabit the Pueblo of Jemez (Ref. 9, 17).

5.3 Soil Exposure and Air Pathway Conclusions

There is no fencing around the site except for the water tanks (Ref. 11). The site poses some threat to the public accessing the site area. A release to the air is suspected because of the dry weather and blowing winds in the area. The contaminated soil around the water tanks is not covered (Ref. 11). Primary targets include the nearby residents, the entire population of 1700 in the Pueblo of Jemez, wetlands and the terrestrial sensitive environments for the habitats of Federally designated endangered species.

6.0 SUMMARY AND CONCLUSIONS

Jemez water tank #1 was in operation from 1963 to 1978 and was closed because of the contaminated sludge formation in the tank. Water tanks, #2 and #3, are in operation since 1978 and 1985 respectively. The entire water system is contaminated with substances of high toxicity, persistence and known carcinogens, as evidenced by the formation of brownish-yellow sludge in the system. Black colloidal particles have been observed in the water. Natural spring water from the Owl Spring is blended into the water system to reduce the levels of contamination. Analytical data also indicates the presence of some metals in the water. To date, brownish-yellow contaminated sludge is washed to the surface soil twice a year. Surface water also has a high potential for contamination by hazardous substances because of the existence of two arroyos next to the site. Snow and rain water flows through the contaminated soil site into these two arroyos and finally into Jemez River. This poses a threat to the sensitive environment and to human targets through food chain contamination since the Jemez River is used for recreational fishing. As the site is not covered or engineered, there is no fence around it, and the site is open to the public, the likelihood of human exposure to contaminated soil is probably high. A release to the air is suspected because of the dry weather and high wind blowing conditions in that area.

REFERENCE:

LORETTO, 1994
(General information on open
dump)

CONTACT REPORT

**PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION
3939 SAN PEDRO NE
ALBUQUERQUE, NM 87110
(505) 884-0480**

CONTACT(S): Stanley Loretto **TITLE:** Environmental Contact

CONTACT(S): **TITLE:**

CONTACT(S): **TITLE:**

ADDRESS: Pueblo of Jemez
P.O. Box 100, Jemez, New Mexico, 87024

PHONE: 505-834-7359 **DATE:** 03/03/94 **TIME:** 1100 Hrs

POEP STAFF MAKING

CONTACT: Kendra L. Tso **TITLE:** Environmental Scientist

SUBJECT: History of Jemez Open Dump

SITE NAME/REASON FOR

CONTACT: Data needed for Jemez Open Dump PA

SITE

ID#: NM0000134007

SUMMARY: Mr. Loretto stated that the existence of the open dump is approximately 20 years. The open dump has two buried trenches and one active trench. The dimensions for these trenches are 150 feet long, 150 feet wide, and 15 feet deep. The type of wastes dumped at the site consist of household wastes, durable goods, and tires. The access hours to the open dump are 24 hours and seven days a week. There is a separate area for dead animals. The dump is only used by tribal members but there are non-tribal members dumping. At one time, there used to a volunteer who would monitor the site and gates. There is fencing around the site. At times there is burning of wastes. The common method of disposal is the trenches are filled to a maximum amount of 12 feet deep, the wastes are then spread, and covered with top soil.

REFERENCE:

**MORGAN, 1994
(Drinking water intakes)**

CONTACT REPORT

**PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION
3939 SAN PEDRO NE
ALBUQUERQUE, NM 87110
(505) 884-0480**

CONTACT(S): Chuck Morgan

TITLE: Environmental

CONTACT(S):

TITLE:

CONTACT(S):

TITLE:

ADDRESS: New Mexico Environmental Department
1018 Camino del Pueblo

PHONE: 505-867-2506

DATE: 05/31/94

TIME: 0900 Hrs

POEP STAFF MAKING

CONTACT: Kendra L. Tso

TITLE: Environmental Scientist

SUBJECT: Jemez River Drinking Water Intakes

SITE NAME/REASON FOR

CONTACT: Data needed for Jemez Open Dump PA

SITE

ID#: NM0000134007

SUMMARY: Mr. Morgan stated that there are no drinking water intakes from the Jemez River. Also stated that the community of San Ysidro and Canones both use an infiltration water supply system to draw water indirectly from the Jemez and Guadalupe rivers. This process is filtered by the soil from the bank. There are several Forest Service wells located at Vista Linda and Spanish which draw water from the Jemez river, this water is not used for surface water intake.

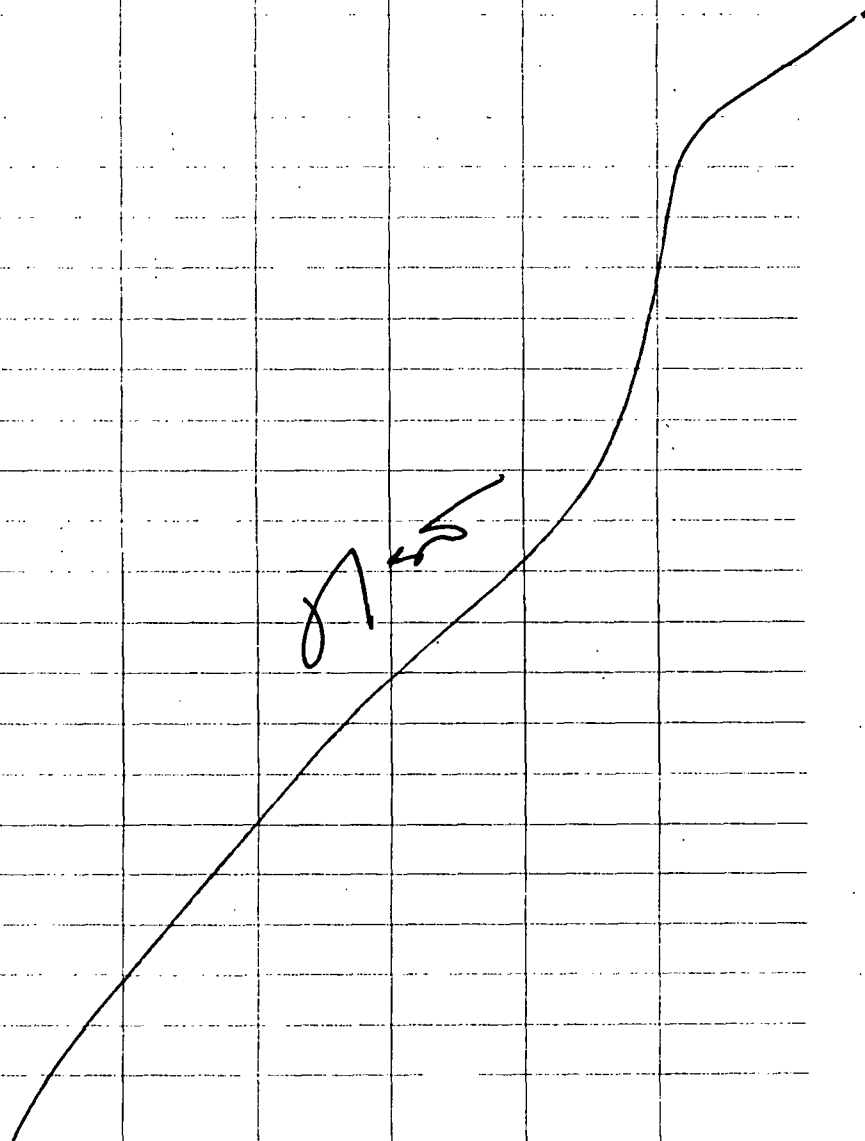
REFERENCE:

**PUEBLO OFFICE OF ENVIRONMENTAL
PROTECTION, 1994
(Dump site information)**

6pg

A. Sanchez

Trading post well drilled 360-400 ft



7pg

Jemez open dump

0843

5 APRIL 94

PARTLY CLOUDY

Temp 58°F

Met with the Governor, Lt. Gov. Stanley Loreto, Tom Candelaria of IHS.

9:35 headed for Dump site.

9:40 - arrived

Photo #1 - facing North - picture of Drums being covered by Branches.

9:41 Photo #2 - facing North - picture of whole pit

9:42 photo #3 - release to air from pit.

9:44 photo #4 - picture of whole dump site ~~etc~~ since it first started.

Nearest residence lives 1/2 mile from site.

The entire dump site ~ 10 acres

No dead animal pit.

9:51 photo #5 photo facing NE picture of drums, stoves, etc.

10:18 photo #6 photo facing East. picture of sign before entering the dump site.

10:20 arrived back @ Gov's office to look over some letters.

8pg

Site Sketch



PLANS TO PUT A WASTE TRANSFER STATION.

ACTIVE MOUND

NO LINER
STAINED SOIL FROM BURNING WASTES

2400N

NEAREST
RESIDENCE

9pg

Laguna

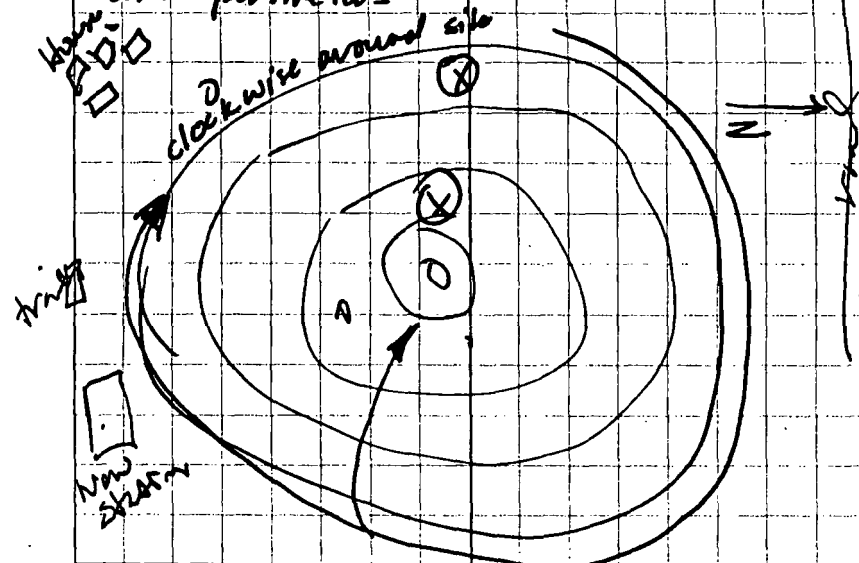
5 May 94

— UST —

weather conditions: breeze from the SW
cloudy, 80°

Commercial Gr.
Victor Castaneda
Barnard Kayate, Tribal Administrator
D. Moore
K. Tso

- Turned the soil twice, two weeks ago was the last time. V.C.
- The yellow colored sand one contaminated
- Testing corners of the site w/ OVM and perimeters



10pg

Photo # 1 - 7 Spad S - N

11:41 pm

8-10 N - E Horses in middle

No readings throughout site
around and inside the middle

- Slight odor present.

mark on other side of site sketch

SW

11pg

Jamez Open Dump — Geology Interpretation

12 May 94

Dr. J. Hawley = J. Rogers

C. Francisco

K. Tso

Witness: C.F.

Weather conditions:

cloudy

Slight breeze

70°F West

Photo #1 Facing South

14:12

Open burning
air exposure

extent length of
the dump

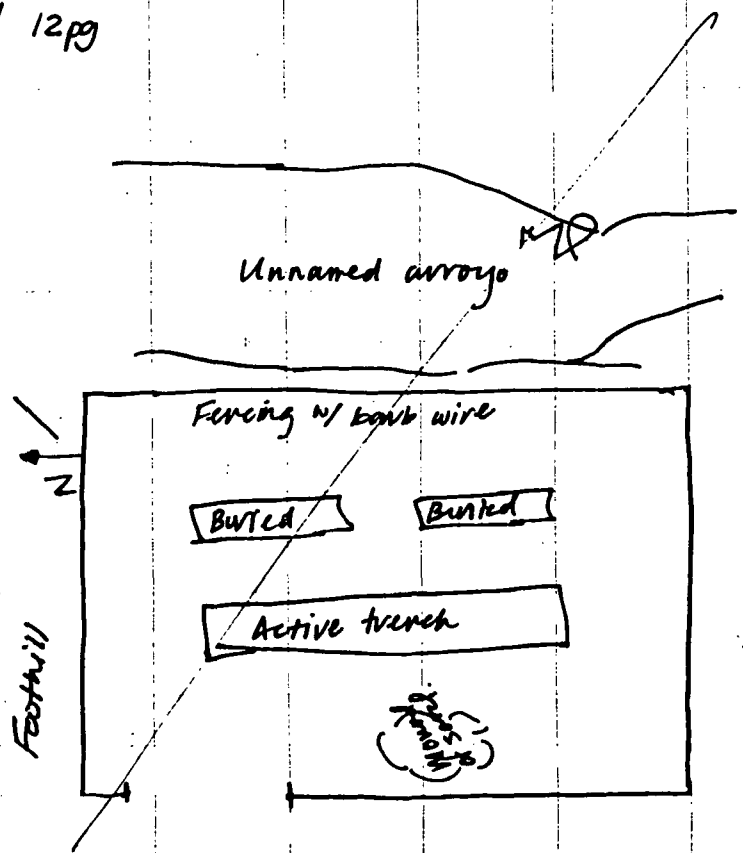
Clean sand, sandy loamy sand
little bit of silt

Two buried trenches

One active trench

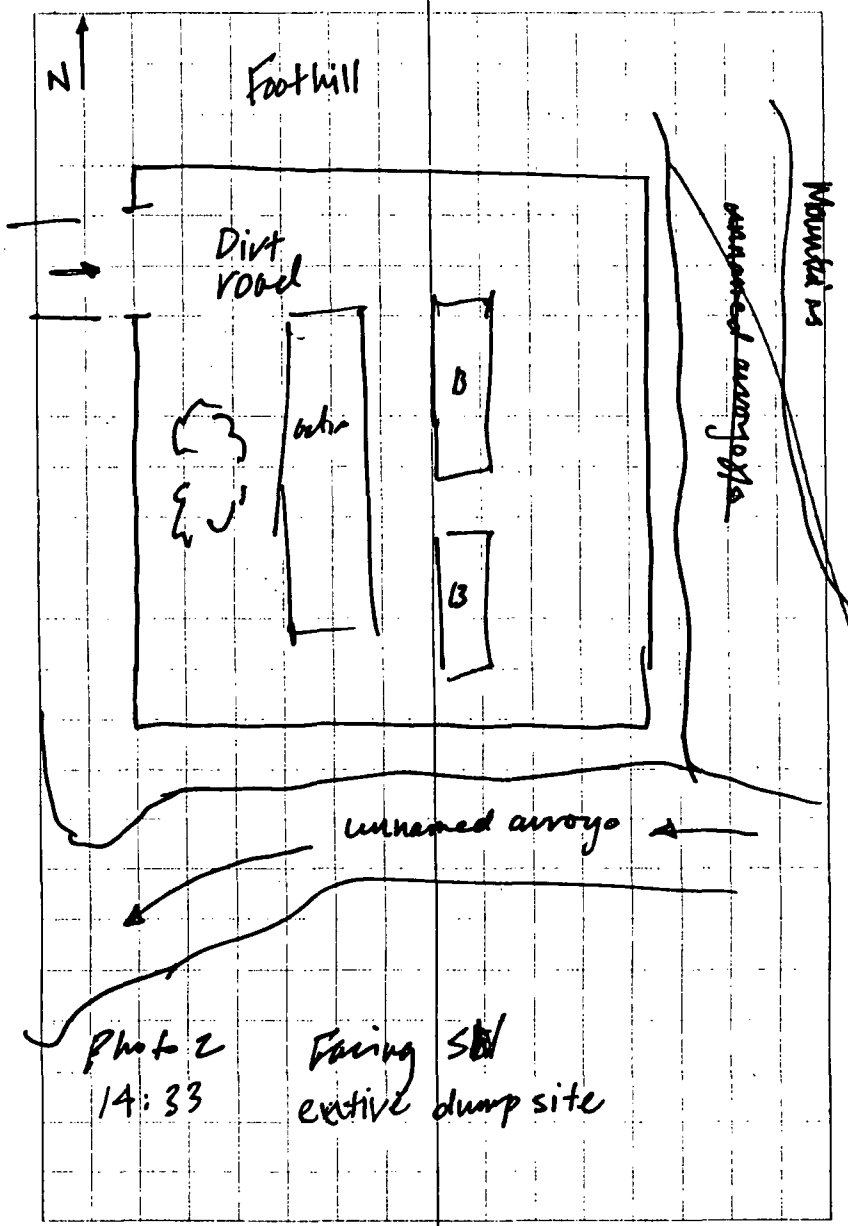
due to the burning can detect a
slight odor.

1 12pg
Pl #



Vegetation
juniper trees
grasses

arroyo 13pg



14pg

Photo #3 Facing South

14:35 dump site

#4 Showing unnamed arroyo

14:36 Same description as above.

Scattered household debris along the fencing
and throughout the dump area.
No gate preventing entrance
access by a dirt road

Vegetation: juniper trees
grasses

Photo #5 Facing NE

15:16

landscape

Photo 12 May

15pg

ZUNI PUEBLO

18 MAY 1994

8:30 AM JERARD TEALATE

TRIBAL OFFICE

MTG. W/ VT. GOV & COUNCIL

SHEEP DIP VATS

PHOTOGRAPHER:
M. MEDINA

WEATHER CONDITIONS WITNESS: KTRD

PARTLY CLOUDY

TEMP: ~ 80

WIND DIRECTION: NW

ACCORDING TO A MEMBER OF THE
COUNCIL DIPPING DOES NOT OCCUR
BUT SPRAYING DOES.

VEGETATION: JUNIPER TREES
GRASSES

1:30 pm: photo #2 picture of whole Pueblo
including the Open Dumping releasing
smoke. photo facing SW - winds @
16 mph.

1:40 pm PHOTO #3 FACING SW
POSSIBLE OLD DIP VAT

REFERENCE:

**PUEBLO OFFICE OF ENVIRONMENTAL
PROTECTION, 1993
(Dump site information)**

[illegible]

#1 pg

Description of Open Dump - 2 trenches
One trench approx. 300 ft. in length
the trench on the NE 200 ft.

Types of Debris - paper, plastic, weeds, organic materials wood bark, Fruits, Cornhusks, etc. wire, glass, scrap metal durable goods - Refrigerator, washers, Dryers, TV sets, water heater, paint cans, drums mostly likely to be used for burning trash. A few wrecked automobiles

No evidence of dead animals, but
could be present.
pit is trending "southwest, Northeast

2m

stained soil from motor oil spilled @ the sight. is @ the north end.

Photo #20 10:03 taken facing the SW of pit #1

Photo #21 10:04 close up shot of pit #1 - Photo taken SW

Photo #3 10:05 photo taken facing NE - along boundary line - showing windblown debris from open pit.

Types of material - paper, plastic + light weight material, highly susceptible highly to the wind.

Photo #23 10:08 Photo taken SW

Photo shows pit #2 & types of material - durable goods, buckets paint cans, municipal waste & unidentifiable cylinders.

Photo #24 10:10 photo # picture showing view of unknown materials from

Roxanne Laboratory, in

Roger stated that Dump is being used by non-tribal members.

Area is unrestricted to animals evidence of cattle, horses grazing

3m

in pit area. Construction material is in pit #2. Pit #1 SW end, construction debris and government issue desk & filing cabinet. Old pit in East ^{boundary} side of pit #2

Photo #25 10:37. photo taken facing NE. photo shows Tribal members dumping trash in pit #1. Wind has picked up to 10-15 mph. New roll of film put into the camera.

Photo #1 roll #2 10:37 photo taken from the NW showing of dump site across arroyo from current dump site. Area has no pits just open Dumping on the surface. Area is quite extensive.

10:40 photo #2. Photo taken facing down wards. photo shows empty medicine bottle in old open dump area

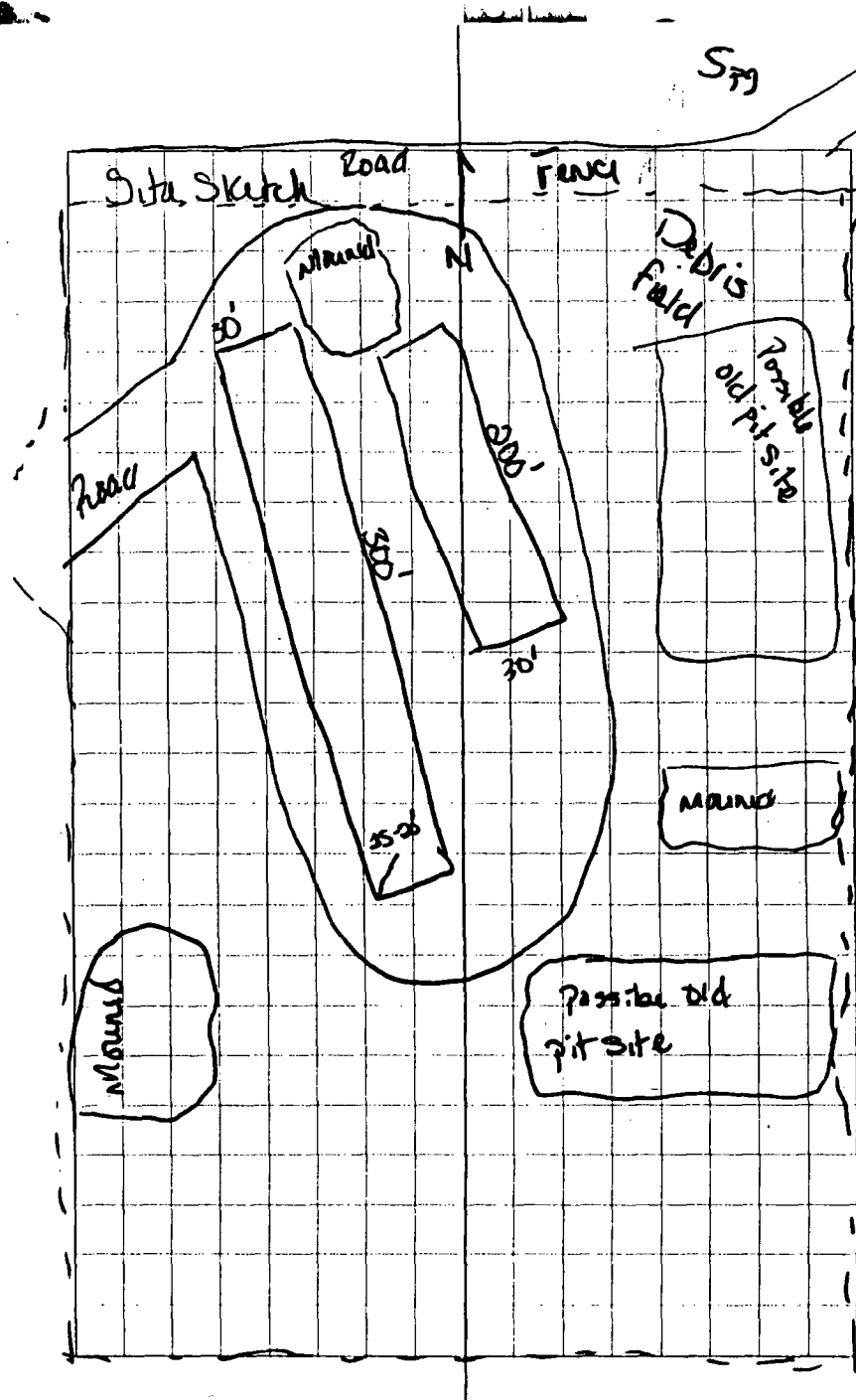
4m

12:13 photo #3 photo taken facing NE, Old car battery dumped @ the Open Dump.

12:33 photo #4 photo taken facing SE. Open Dump site, heading toward Owl Springs. Old car battery.

12:36 photo #5 photo taken facing West - picture of bucket

12:41 photo #6 photo taken facing East. picture of empty oil drum.



REFERENCE:

SHENDO, 1993
(Temperature information)

CONTACT REPORT

PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION
3939 SAN PEDRO NE.
ALBUQUERQUE, NM. 87110
(505)884-0480

CONTACT(S): Leonard Shendo TITLE: Tribal Maintenance
CONTACT(S): _____ TITLE: _____
CONTACT(S): _____ TITLE: _____
CONTACT(S): _____ TITLE: _____

ADDRESS: Pueblo of Jemez
P.O. Box 100 Jemez, NM 87024

PHONE: (505) 834-7359 DATE: 3/17/93 TIME: 8:30am

POEP STAFF MAKING
CONTACT: Syed Rizvi

SUBJECT: Site Information on Jemez Water Tanks

SITE NAME/REASON FOR
CONTACT: Site Information ID#: _____

SUMMARY: Temperature Ranges, summer 80-90 F, winter 30-40 F. There are two arroyos
near the tanks. Tank #2 (Houpo Wawa, South Arroyo) and Tank #3 (Canal Lane Arroyo). Distribution
system is designed as such that some of the houses get their water through the distributing lines
before it gets to tank #2 and tank #3. Black Colloidal Particles have been seen in the water.
No proper sampling and any action has been taken till now. Water also smells strong sulfur some-
times. Two arroyos are located few hundred yards near the tanks (approximately 200 yards).
Through the arroyos, water flows into the Jemez River. Flow rate 5-10 ft.3/second.
There is no fencing around the contaminated soil area, and the soil is not covered. Open to
Public. There is brownish yellow staining of the soil near the tanks.

REFERENCE:

**U.S. ENVIRONMENTAL PROTECTION
AGENCY, DISCOVERY INVENTORY,
1990
(Site location information)**

REFERENCE:

**U.S. FISH & WILDLIFE SERVICES, 1980
(Wetlands information)**

X 60 MINUTE SERIES (WETLANDS)

1:100 000-scale
wetland map of

Los Alamos

NEW MEXICO



30 X 60 MINUTE QUADRANGLE
SHOWING

- Wetland classifications
- Highways, roads and other manmade structures
- Water features
- Geographic names



FISH & WILDLIFE SERVICE

1980

Produced by the United States Fish and Wildlife Service

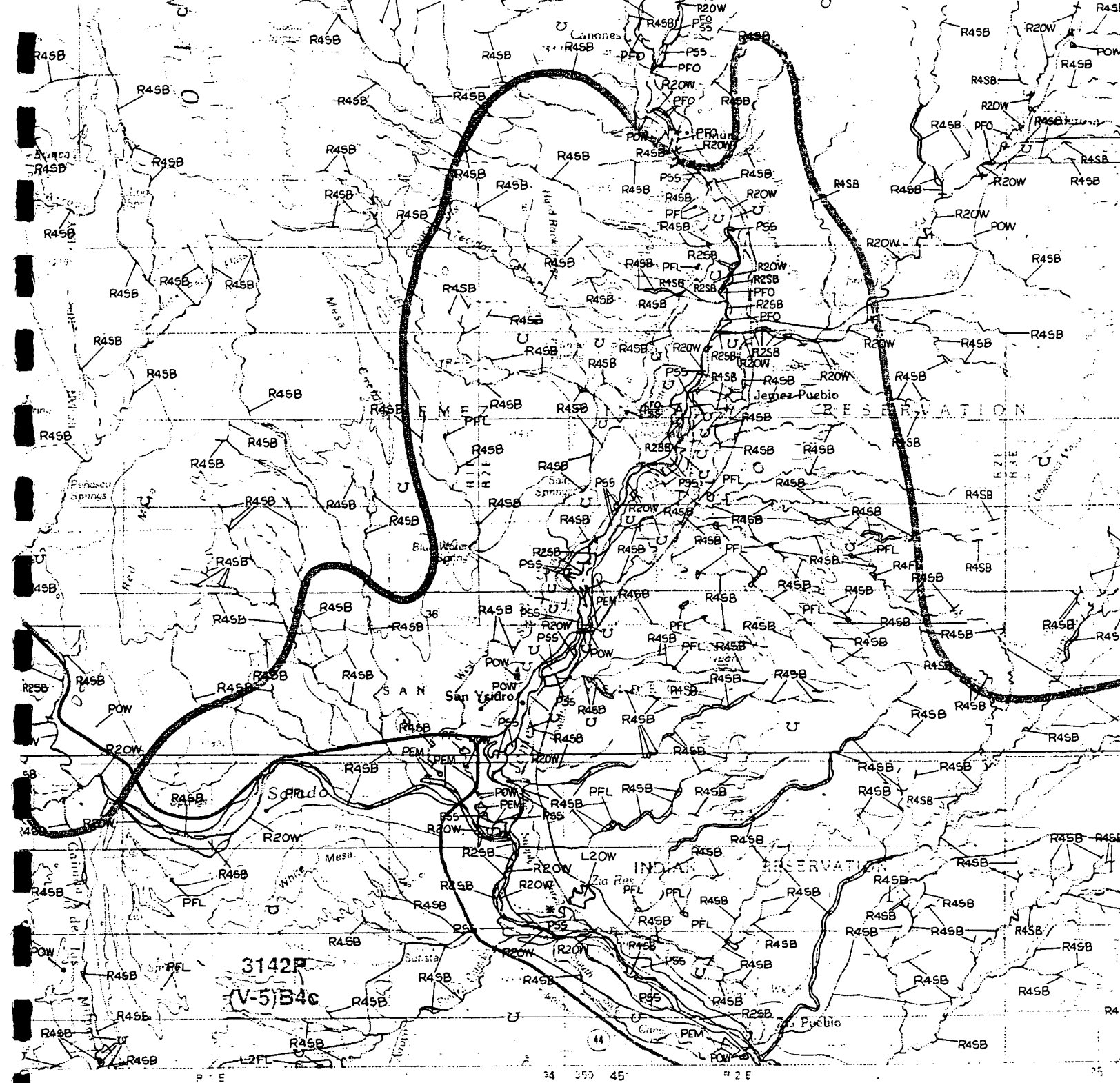
Wetland classifications from 1:80 000-scale black and white aerial photographs taken 1975-1976, and other source data.

Projection and 10 000-meter grid, zone 13: Universal Transverse Mercator

50 000-foot grid ticks based on New Mexico coordinate system, central zone

1927 North American datum

To place on the predicted North American datum 1983, move projection lines 52 meters east



KILOMETERS

MILES

MARINE
1 SUBTIDAL
 OW Open Water/Unknown Bottom
 RB Rock Bottom
 UB Unconsolidated Bottom
 AB Aquatic Bed
 RF Reef

M MARINE
2 INTERTIDAL
 AB Aquatic Bed
 RF Reef
 FL Flat
 RS Rocky Shore
 BB Beach/Bar

E ESTUARINE
1 SUBTIDAL
 OW Open Water/Unknown Bottom
 RB Rock Bottom
 UB Unconsolidated Bottom
 AB Aquatic Bed
 RF Reef

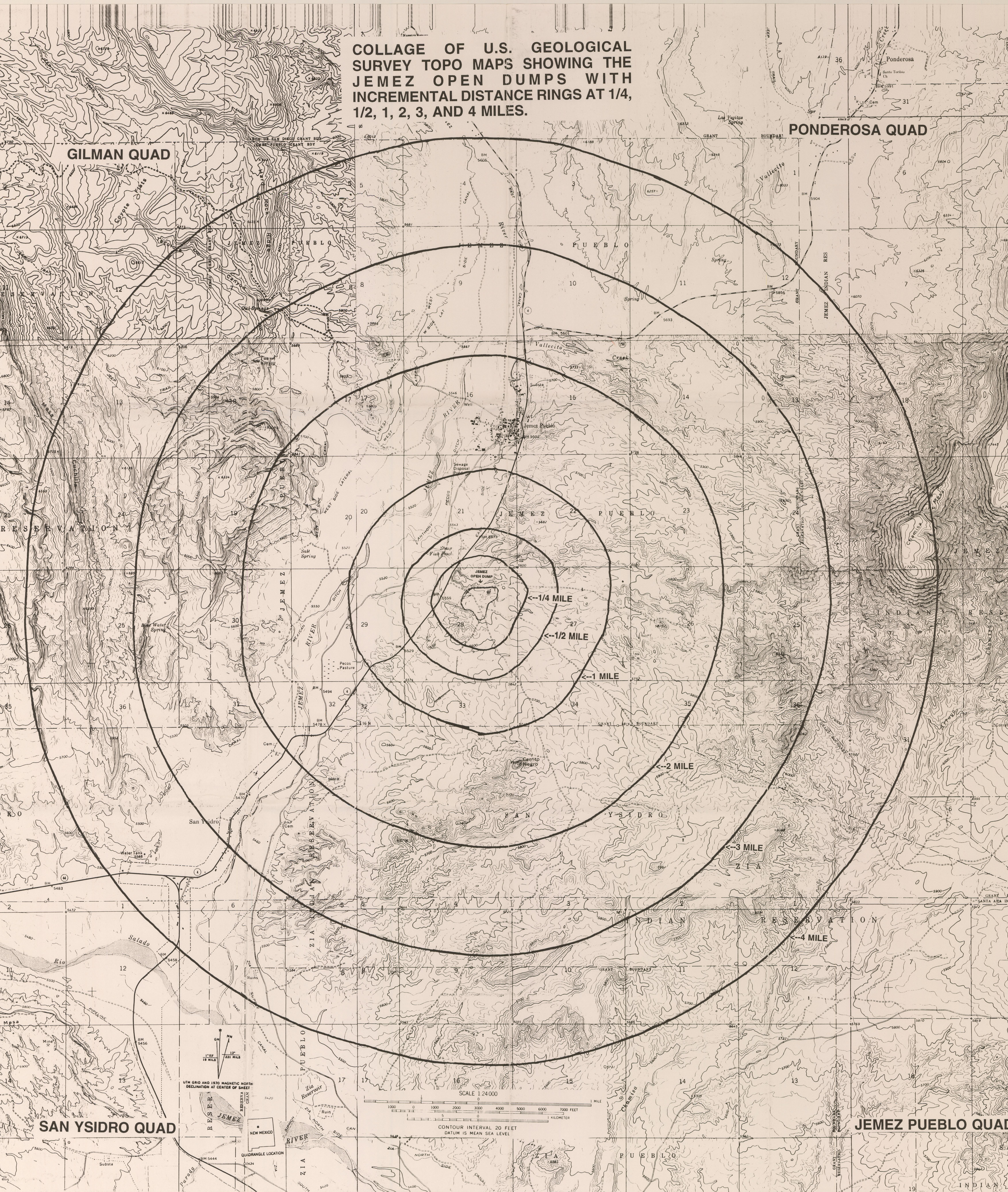
E ESTUARINE
2 INTERTIDAL
 AB Aquatic Bed
 RF Reef
 FL Flat
 SB Streambed
 RS Rocky Shore
 BB Beach/Bar
 EM Emergent
 SS Scrub/Shrub
 FO Forested

R RIVERINE
1 TIDAL
 EM Emergent (Fl)
 OW Open Water
 RB Rock Bottom
 UB Unconsolidated
 AB Aquatic Bed
 FL Flat
 SB Streambed
 RS Rocky Shore
 BB Beach/Bar

REFERENCE:

**U.S.G.S., 1972
(United States Geological Survey:
Collage of Maps)**

**COLLAGE OF U.S. GEOLOGICAL
SURVEY TOPO MAPS SHOWING THE
JEMEZ OPEN DUMPS WITH
INCREMENTAL DISTANCE RINGS AT 1/4,
1/2, 1, 2, 3, AND 4 MILES.**



REFERENCE:

**U.S.G.S., 1972
(United States Geological Survey:
Water resource data)**



Water Resources Data New Mexico Water Year 1992

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT NM-92-1
Prepared in cooperation with the State of New Mexico
and with other agencies

RIO GRANDE BASIN

08324000 JEMEZ RIVER NEAR JEMEZ, NM

LOCATION.--Lat 35°39'42", long 106°44'34", Sandoval County, Hydrologic Unit 13020202, in Canon de San Diego Grant, on left bank 0.7 mi downstream from Rio Guadalupe, 3.5 mi north of Jemez, and at mile 29.5.

DRAINAGE AREA.--470 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1936 to May 1941, August 1949 to October 1950, May 1951 to September 1952 (irrigation seasons only), March 1953 to current year. Monthly discharge only for some periods, published in WSP 1732. Published as Jemez Creek near Jemez, 1936-41.

REVISED RECORDS.--WSP 1712: Drainage area. WSP 1923, 1957-58.

GAGE.--Water-stage recorder. Concrete control since Dec. 6, 1965. Datum of gage is 5,622 ft above National Geodetic Vertical Datum of 1929 (plane-table survey by Topographic Division, U.S. Geological Survey, 1952). June 22, 1936, to Mar. 11, 1937, at site 60 ft upstream at datum 0.50 ft higher. Mar. 12, 1937, to July 8, 1938, at present site at datum 0.7 ft higher. July 9, 1938, to May 6, 1941, at site 60 ft upstream at datum 0.70 ft higher.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are poor. Diversion for irrigation of about 300 acres upstream from station. Several observations of water temperature were made during the year. U.S. Army Corps of Engineers satellite telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum flood since at least 1890 occurred between May 6 and 15, 1941, after gage was destroyed (discharge probably exceeded 6,000 ft³/s), from information by local residents.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	34	47	51	48	82	362	511	221	37	35	39
2	48	48	42	39	50	90	329	518	198	34	31	37
3	45	37	42	43	50	99	330	503	179	34	30	34
4	42	34	50	60	52	98	442	480	163	34	31	30
5	39	46	55	55	53	91	518	445	163	30	30	30
6	38	48	58	59	51	88	544	392	153	31	31	29
7	37	50	54	55	49	99	781	378	136	31	41	27
8	37	49	58	48	57	109	894	362	131	27	38	26
9	35	44	53	40	57	107	896	384	132	29	29	25
10	36	42	51	48	56	99	912	512	121	29	28	23
11	34	47	64	54	57	100	1030	417	111	31	41	23
12	35	56	65	57	56	104	948	355	104	34	50	23
13	34	50	52	56	56	113	972	354	91	36	49	22
14	34	55	46	44	62	126	1050	344	83	37	40	26
15	34	97	52	46	49	146	958	329	76	33	40	27
16	35	98	55	46	56	157	809	303	68	31	35	26
17	37	76	56	54	52	181	735	280	64	27	34	23
18	30	77	63	49	43	177	677	270	60	27	32	25
19	30	63	60	49	47	163	601	258	59	30	28	33
20	30	54	58	48	53	165	500	269	57	28	26	35
21	29	69	59	54	58	177	457	335	61	27	30	32
22	30	72	60	50	58	177	430	327	56	28	31	32
23	31	49	55	46	65	173	411	348	52	29	37	29
24	34	53	55	49	62	184	423	400	48	55	83	29
25	35	64	53	49	59	195	444	362	47	47	156	26
26	34	58	59	49	66	230	458	327	49	42	77	26
27	33	58	54	48	63	272	469	295	45	41	62	27
28	33	62	46	48	67	282	494	281	42	35	47	27
29	38	60	56	47	74	314	504	238	43	42	39	26
30	39	53	49	48	---	313	519	261	44	38	36	27
31	36	---	58	49	---	343	---	272	---	35	37	---
TOTAL	1111	1703	1685	1538	1626	5054	18897	11110	2857	1049	1334	844
MEAN	35.8	56.8	54.4	49.6	56.1	163	630	358	95.2	33.8	43.0	28.1
MAX	49	98	65	60	74	343	1050	518	221	55	156	39
MIN	29	34	42	39	43	82	329	238	42	27	26	22
AC-FT	2200	3380	3340	3050	3230	10020	37480	22040	5670	2080	2650	1670

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1992, BY WATER YEAR (WY)

	MEAN	36.5	38.2	28.8	27.9	35.1	82.4	276	241	65.8	33.0	46.8	35.0
MAX	109	128	58.2	49.6	72.3	221	961	1118	274	78.5	121	95.8	
(WY)	1987	1987	1987	1992	1986	1985	1958	1973	1979	1986	1957	1991	
MIN	14.5	18.4	17.0	16.6	19.9	31.6	43.3	22.5	11.9	14.5	15.8	11.1	
(WY)	1957	1957	1957	1977	1955	1981	1955	1967	1955	1972	1956	1956	

SUMMARY STATISTICS

FOR 1991 CALENDAR YEAR

FOR 1992 WATER YEAR

WATER YEARS 1954 - 1992

ANNUAL TOTAL	35293	48808	79.0
ANNUAL MEAN	96.7	133	189
HIGHEST ANNUAL MEAN			29.3
LOWEST ANNUAL MEAN			3160
HIGHEST DAILY MEAN	743	Apr 7	2.1
LOWEST DAILY MEAN	24	Jan 11	6.0
ANNUAL SEVEN-DAY MINIMUM	27	Jan 6	a5900
INSTANTANEOUS PEAK FLOW			b10.10
INSTANTANEOUS PEAK STAGE			1.2
INSTANTANEOUS LOW FLOW			
ANNUAL RUNOFF (AC-FT)	70000	96810	57200
10 PERCENT EXCEEDS	237	386	170
50 PERCENT EXCEEDS	58	53	34
90 PERCENT EXCEEDS	30	30	18

a-From rating curve extended above 2,200 ft³/s on basis of contracted-opening measurement of peak flow.

b-Present datum.

REFERENCES:

**U.S.G.S., 1992
(United States Geological
Survey, Water-resource
investigations report, well
information)**

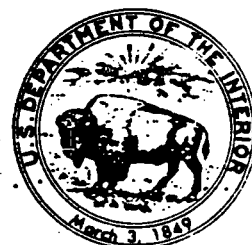
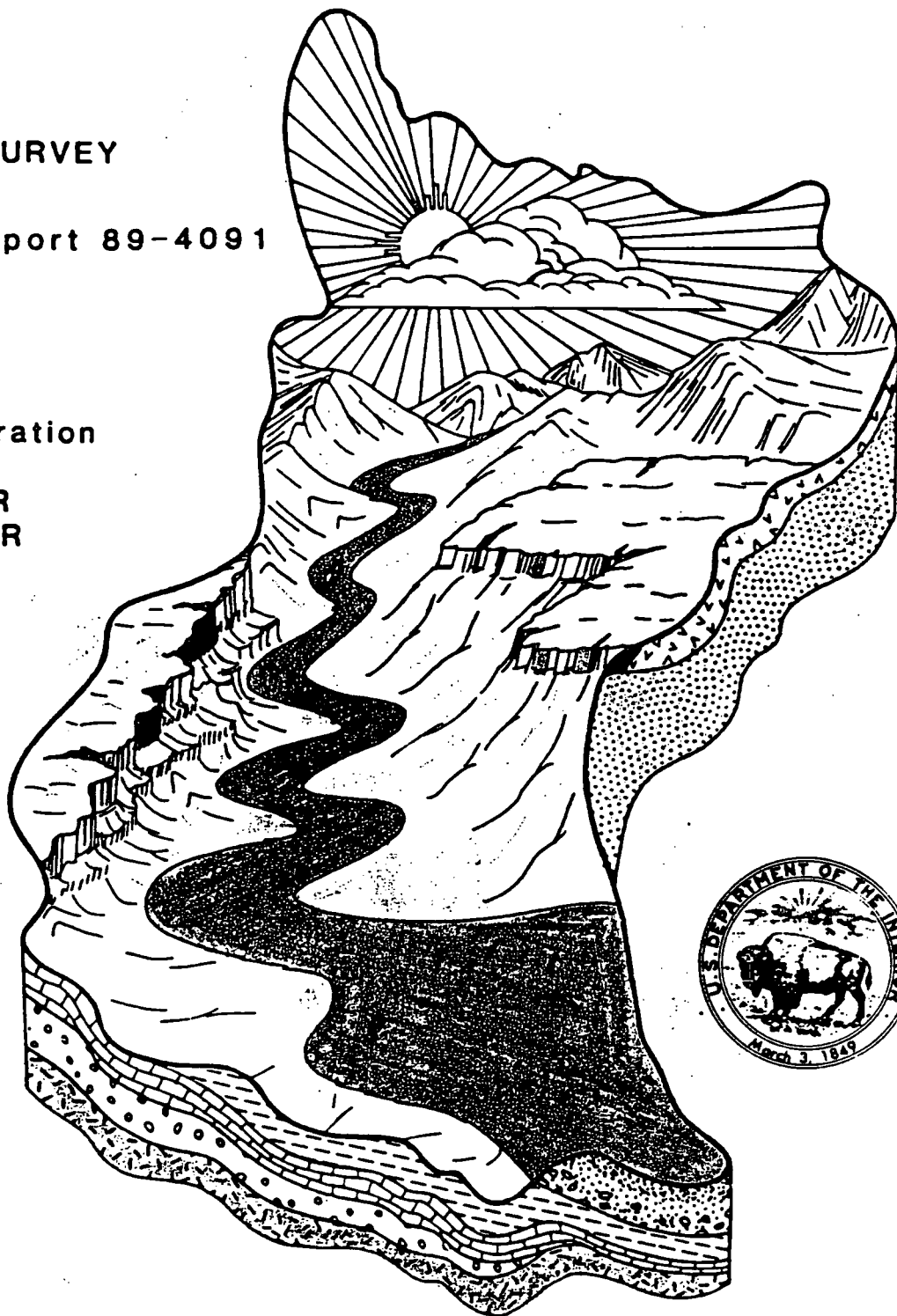
WATER RESOURCES ON THE PUEBLOS OF JEMEZ, ZIA, AND SANTA ANA, SANDOVAL COUNTY, NEW MEXICO

U.S. GEOLOGICAL SURVEY

Water-Resources

Investigations Report 89-4091

Prepared in cooperation
with the
**JEMEZ RIVER
INDIAN WATER
AUTHORITY**



4211

REFERENCE:

VANNOZZI, 1993
(Climate information)

CONTACT REPORT

PUEBLO OFFICE OF ENVIRONMENTAL PROTECTION
3939 SAN PEDRO NE.
ALBUQUERQUE, NM. 87110
(505) 884-0480

CONTACT(S): Larry Vannozzi TITLE: Meterologist

CONTACT(S): _____ TITLE: _____

CONTACT(S): _____ TITLE: _____

CONTACT(S): _____ TITLE: _____

ADDRESS: National Weather Services
Albuquerque, NM

PHONE: (505) 243-0702 DATE: 3/17/93 TIME: 2:30pm

POEP STAFF MAKING

CONTACT: Syed Rizvi

SUBJECT: Average Rainfall Information

SITE NAME/REASON FOR

CONTACT: Jemez Water Tanks @ Pueblo of Jemez ID#: _____

SUMMARY: For the average mean precipitation at Pueblo of Jemez, the
Jemez Spring is the check spot and an average from 1931 to 1983 concludes
the mean average precipitation at Pueblo of Jemez is 16.94 inches.

Sy Rizvi

**U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION**

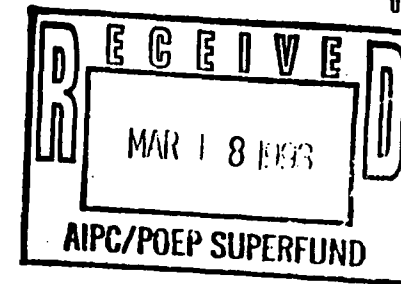


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Syed Rizvi

POEP

PO Box 3256

Albuquerque, NM 87190

ANNUAL SUMMARY - TEMPERATURE

	Averages			Daily Extremes				Mean Extremes				#Days-Max		#Days-Min	
	Max	Min	Mean	High---	---Date	Low----	---Date	High--Yr	Low--Yr			=>90°	<=32°	<=32°	<=0°
Ja	45.4	19.9	32.7	68	20/1950	-18	6/1971	39.5	56	24.6	37	0	2	30	1
Fe	50.0	23.2	36.6	72	19/1981	-13	1/1951	44.4	57	26.1	39	0	1	26	0
Ma	56.4	28.0	42.2	78	26/1971	3*	3/1971	49.2	34	36.7	69	0	0	23	0
Ap	66.0	34.8	50.4	84*	21/1954	10	5/1983	56.5	54	45.2	41	0	0	11	0
Ma	74.2	42.4	58.3	93	27/1951	24	3/1970	62.7	34	53.9	35	0	0	2	0
Jn	83.6	50.7	67.2	101	21/1974	31	2/1973	72.1	81	60.4	47	8	0	0	0
Jl	86.3	56.6	71.5	100*	19/1980	45	19/1960	76.4	80	67.1	73	12	0	0	0
Au	83.6	55.3	69.4	98	6/1977	40	22/1973	72.6	77	66.2	71	5	0	0	0
Se	78.4	48.9	63.7	95	2/1950	30*	20/1971	68.2*	83	60.2*	73	1	0	0	0
Oc	68.6	38.9	53.8	90	1/1980	18	28/1970	60.4	50	47.0	70	0	0	5	0
No	56.0	28.2	42.1	77	7/1934	-7	28/1976	47.9	49	33.0	47	0	0	21	0
De	47.5	21.8	34.6	70	4/1949	-7	9/1978	42.0	80	27.7	67	0	1	29	0
An	66.3	37.4	51.9	101	6/21/74	-18	1/ 6/71	54.8	81	49.7	71	26	4	146	2
Wi	47.6	21.6	34.7	72	2/19/81	-18	1/ 6/71	41.0	81	29.7	33	0	4	85	2
Sp	65.5	35.0	50.3	93	5/27/51	3	3/ 3/71	55.2	34	47.4	70	0	0	36	0
Su	84.5	54.2	69.3	101	6/21/74	31	6/ 2/73	73.3	80	65.7	41	24	0	0	0
Fa	67.7	38.7	53.2	95	9/ 2/50	-7	11/28/76	56.6	77	49.8	70	1	0	26	0
#Y	53	53	53	53		53		45		45		37	37	37	37

ANNUAL SUMMARY - PRECIPITATION

	Total Precipitation							Snow			#Days		
	Mean	High--Yr		Low--Yr		24 Hr	Max	Mean	High--Yr		=>.10	=>.50	=>1.00
Ja	0.95	4.00	50	0.00	76	2.06	30/1950	8.0	32.2	39	3	0	0
Fe	0.91	2.52	31	0.00	54	0.95	15/1975	6.9	21.5	64	3	0	0
Ma	1.05	3.99	41	0.00	56	1.00	10/1974	5.0	20.5	41	3	0	0
Ap	0.88	2.84	49	0.00	56	1.03*	11/1969	2.0	15.0	44	2	0	0
Ma	1.17	3.84	35	0.00	50	1.21	2/1978	0.2	5.6	78	3	1	0
Jn	1.14	4.77	33	0.00*	51	1.70	29/1978	0.0	0.0	0	2	0	0
Jl	2.44	4.70	70	0.48	47	1.75	14/1951	0.0	0.0	0	8	1	0
Au	3.10	7.03	57	0.50	62	2.24	22/1982	0.0	0.0	0	8	2	1
Se	1.87	7.68	38	0.00	56	1.53	5/1981	0.0	0.8	35	4	1	0
Oc	1.59	6.25	57	0.00*	77	2.78	16/1960	0.2	5.9	32	3	1	0
No	0.90	4.72	78	0.00*	56	1.56	5/1957	2.5	13.3	46	3	1	0
De	0.94	3.23	40	0.00*	73	1.57	10/1965	7.7	25.5	67	3	1	0
An	16.94	28.72	57	6.17	56	2.78	10/16/60	32.7	73.4	41	44	8	2
Wi	2.80	6.67	41	0.85	54	2.06	1/30/50	22.7	48.8	41	8	1	0
Sp	3.10	9.11	41	0.03	56	1.21	5/ 2/78	7.3	25.5	58	8	1	0
Su	6.68	12.02	33	2.70	80	2.24	8/22/82	0.0	0.0	0	18	3	1
Fa	4.36	12.73	31	0.23	56	2.78	10/16/60	2.7	13.3	46	10	2	1
#Y	53	47		47		37		53	37		30	33	37

Station Coordinates: 35°46' N 106°41' W 6230 ft

* - also in earlier years; #Y - number of years of data

=> - equal to or greater than; <= - less than or equal to

Office of State Climatologist, NM Dept of Agriculture, Las Cruces, NM